

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

David R. Catanach, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-4 or 3160-5 form.

Operator Signature Date: 11/30/16

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner	UL	Sec	Twp	N/S	Rng	W/E	Feet	NS	Ft	EW	Last Insp	
30-043-21276-00-00	N ALAMITO UNIT	306H	ENCANA OIL & GAS (USA) INC.	O	N	Sandoval	F		L	34	23	N	7	W	1403	S	762	W	12/12/2016

Drilling/Casing Change

Conditions of Approval:

(See the below checked and additional conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☐ Hold C-104 for ☐ NSL, ☐ NSP, ☐ DHC
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☐ Ensure compliance with 19.15.17
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

Additional requirements

If cement fails to circulate on any of the stages, notify OCD.

NMOCD Approved by Signature

12/21/16

Date

RECEIVED

DEC 01 2016

Form 3160-5
(June 2015)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.Farmington Field Office
Bureau of Land Management5. Lease Serial No.
NMNM 16586

6. If Indian, Allottee or Tribe Name

N/A

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☒ Oil Well☐ Gas Well☐ Other

OIL CONS. DIV DIST. 3

2. Name of Operator

Encana Oil & Gas (USA) Inc.

3a. Address

370 17th Street, Suite 1700
Denver, CO 80202

3b. Phone No. (include area code)

(720) 876-3533

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SHL: 1403' FSL and 762' FWL Section 34, T23N, R7W
BHL: 720' FNL and 630' FWL Section 33, T23N, R7W

7. If Unit of CA/Agreement, Name and/or No.

NMNM 135229X

8. Well Name and No.

North Alamo Unit 306H (FKA Lybrook L34-2307 01H)

9. API Well No.

30-043-21276

10. Field and Pool or Exploratory Area

Alamito Mancos N (OIL)

11. Country or Parish, State

Sandoval County, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other - Name Change & Update SHL & BHL
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompletable horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletable in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Encana Oil & Gas (USA) Inc. (Encana) recently finalized the formation of a 14,262.78 acre Federal exploratory unit named the North Alamo Unit. The North Alamo Unit hearing occurred on June 9, 2016 at the New Mexico Oil Conservation Division in Santa Fe, in which, Encana requested an undivided unit be formed that would also encompass its own unique oil pool designation. The Lybrook L34-2307 01H well, which was approved by the BLM on May 18, 2016, will now be a part of the North Alamo Unit. Encana is submitting this sundry to change the well name from the Lybrook L34-2307 01H to the North Alamo Unit 306H.

In addition to the name change, the SHL was modified from 1491' FSL, 783' FWL to 1403' FSL, 762' FWL. Also, the BHL and POE were updated to reflect Encana's intent to drill this well in a transverse orientation (SE-NW) as opposed to the E-W orientation that was originally proposed.

Attached is an updated Survey Plat package, a Directional Drilling Plan, 10-Point Drilling Plan and Wellbore Diagram that reflect these changes.

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)

Katie Wegner

Title Senior Regulatory Analyst

Signature

Date

11/30/2016

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Abdelgadir Elmadani

Title

PE

Date

12/12/16

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

FFO

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

DOWN

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (505) 393-6161 Fax: (505) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (505) 748-1283 Fax: (505) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6176 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to appropriate
District Office

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-043-21276		2 Pool Code 98174		3 Pool Name ALAMITO MANCOS N (OIL)	
4 Property Code 317188		5 Property Name NORTH ALAMITO UNIT			6 Well Number 306H
7 OGRID No. 282327		8 Operator Name ENCANA OIL & GAS (USA) INC.			9 Elevation 6894.6'

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	34	23N	7W		1403'	SOUTH	762'	WEST	SANDOVAL

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	33	23N	7W		720'	NORTH	630'	WEST	SANDOVAL

12 Dedicated Acres PENETRATED SPACING UNIT; ALL SEC. 33 (640 ACRES), W/2 SEC. 34 (320 ACRES) TOTAL 14,262.78 ACRES: T23N R7W SEC's 19-23 (ALL); 25-34 (ALL); 35 (NW/4); T22N R7W SEC's 3 (N/2); 4 (N/2); 5 (N/2, SW/4); 6 (ALL); 7 (N/2); 8 (NW/4); T23N R6W SEC's 25 & 36 (ALL); T22N R6W SEC's 1 (ALL) & 12 (N/2) - UNDIVIDED UNIT		13 Joint or Infill	14 Consolidation Code	15 Order No. R-14081-A (14,262.78 acres)
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16			17 OPERATOR CERTIFICATION		
FND 2 1/2" BC GLO 1947 FND 2 1/2" BC GLO 1948 WELL FLAG LAT. 36.179682° N (NAD83) LONG. 107.568393° W (NAD83) LAT. 36.179668° N (NAD27) LONG. 107.567786° W (NAD27) ENTRY POINT LAT. 36.177770° N (NAD83) LONG. 107.572090° W (NAD83) LAT. 36.177756° N (NAD27) LONG. 107.571483° W (NAD27) BOTTOM HOLE LAT. 36.188611° N (NAD83) LONG. 107.586647° W (NAD83) LAT. 36.188597° N (NAD27) LONG. 107.586039° W (NAD27) W/4 CORNER SEC 33 LAT. 36.183233° N (NAD83) LONG. 107.588775° W (NAD83) LAT. 36.183218° N (NAD27) LONG. 107.588167° W (NAD27) SW CORNER SEC 33 LAT. 36.175945° N (NAD83) LONG. 107.588775° W (NAD83) LAT. 36.175931° N (NAD27) LONG. 107.588167° W (NAD27) NW CORNER SEC 28 LAT. 36.190597° N (NAD83) LONG. 107.588788° W (NAD83) LAT. 36.190583° N (NAD27) LONG. 107.588180° W (NAD27) NW CORNER SEC 34 LAT. 36.190525° N (NAD83) LONG. 107.571034° W (NAD83) LAT. 36.190511° N (NAD27) LONG. 107.570427° W (NAD27) Diagram: A survey plat showing sections 33 and 34. Section 33 is on the left and section 34 is on the right. A horizontal drill line is shown across both sections. The diagram includes bearings and distances for the well location and section corners. A dashed line indicates the horizontal drill path. The well location is marked with a red dot and labeled 'BH'. The diagram also shows the 'BASIS OF BEARINGS' and 'HORIZONTAL DRILL'.			I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Katie Wegner</i> 11/30/16 Signature Date Katie Wegner Printed Name katie.wegner@encana.com E-mail Address		
18			SURVEYOR CERTIFICATION		
			I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. JANUARY 26, 2015 Date of Survey Signature and Seal of Professional Surveyor: <i>Henry P. Broadhurst Jr.</i> 11/04/2016 Certificate Number 11393		

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Phone: (505) 334-6178 Fax: (505) 334-6170

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Phone: (505) 476-3480 Fax: (505) 476-3482

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to appropriate
District Office

OIL CONSERVATION DIVISION

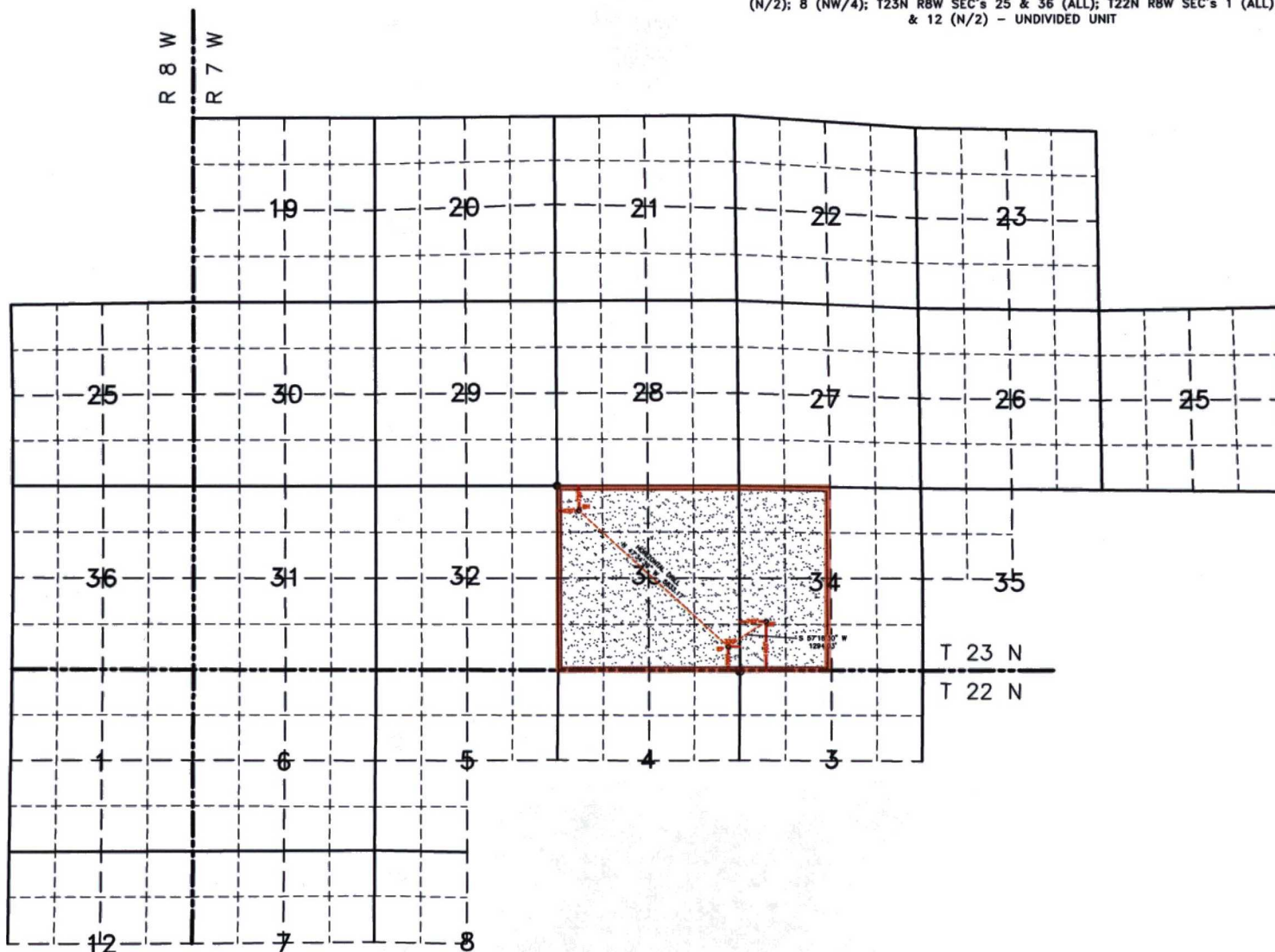
1220 South St. Francis Dr.
Santa Fe, NM 87505

☐ AMENDED REPORT

ENCANA OIL & GAS (USA) INC.
NORTH ALAMITO UNIT #306H

PENETRATED SPACING UNIT; ALL SEC. 33 (640 ACRES),
W/2 SEC. 34 (320 ACRES)

TOTAL 14,262.78 ACRES: T23N R7W SEC's 19-23 (ALL); 25-34 (ALL); 35 (NW/4); T22N R7W SEC's 3 (N/2); 4 (N/2); 5 (N/2, SW/4); 6 (ALL); 7 (N/2); 8 (NW/4); T23N R8W SEC's 25 & 36 (ALL); T22N R8W SEC's 1 (ALL) & 12 (N/2) - UNDIVIDED UNIT



WELL FLAG

LAT. 36.179682° N (NAD83)
LONG. 107.568393° W (NAD83)
LAT. 36.179668° N (NAD27)
LONG. 107.567786° W (NAD27)

ENTRY POINT

LAT. 36.177770° N (NAD83)
LONG. 107.572090° W (NAD83)
LAT. 36.177756° N (NAD27)
LONG. 107.571483° W (NAD27)

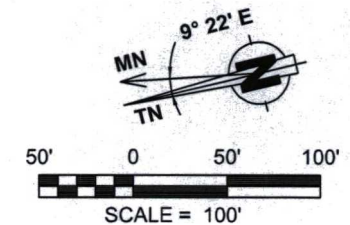
BOTTOM HOLE

LAT. 36.188611° N (NAD83)
LONG. 107.586647° W (NAD83)
LAT. 36.188597° N (NAD27)
LONG. 107.586039° W (NAD27)

LATITUDE: 36.179682° N
LONGITUDE: 107.568393° W
DATUM: NAD83

ENCANA OIL & GAS (USA) INC.
NORTH ALAMITO UNIT 306H (FKA LYBROOK L34-2307 01H)

1403' FSL & 762' FWL
LOCATED IN THE NW/4 SW/4 OF SECTION 34,
T23N, R7W, N.M.P.M.,
SANDOVAL COUNTY, NEW MEXICO
GROUND ELEVATION: 6893', NAVD 88
FINISHED PAD ELEVATION: 6894.6', NAVD 88



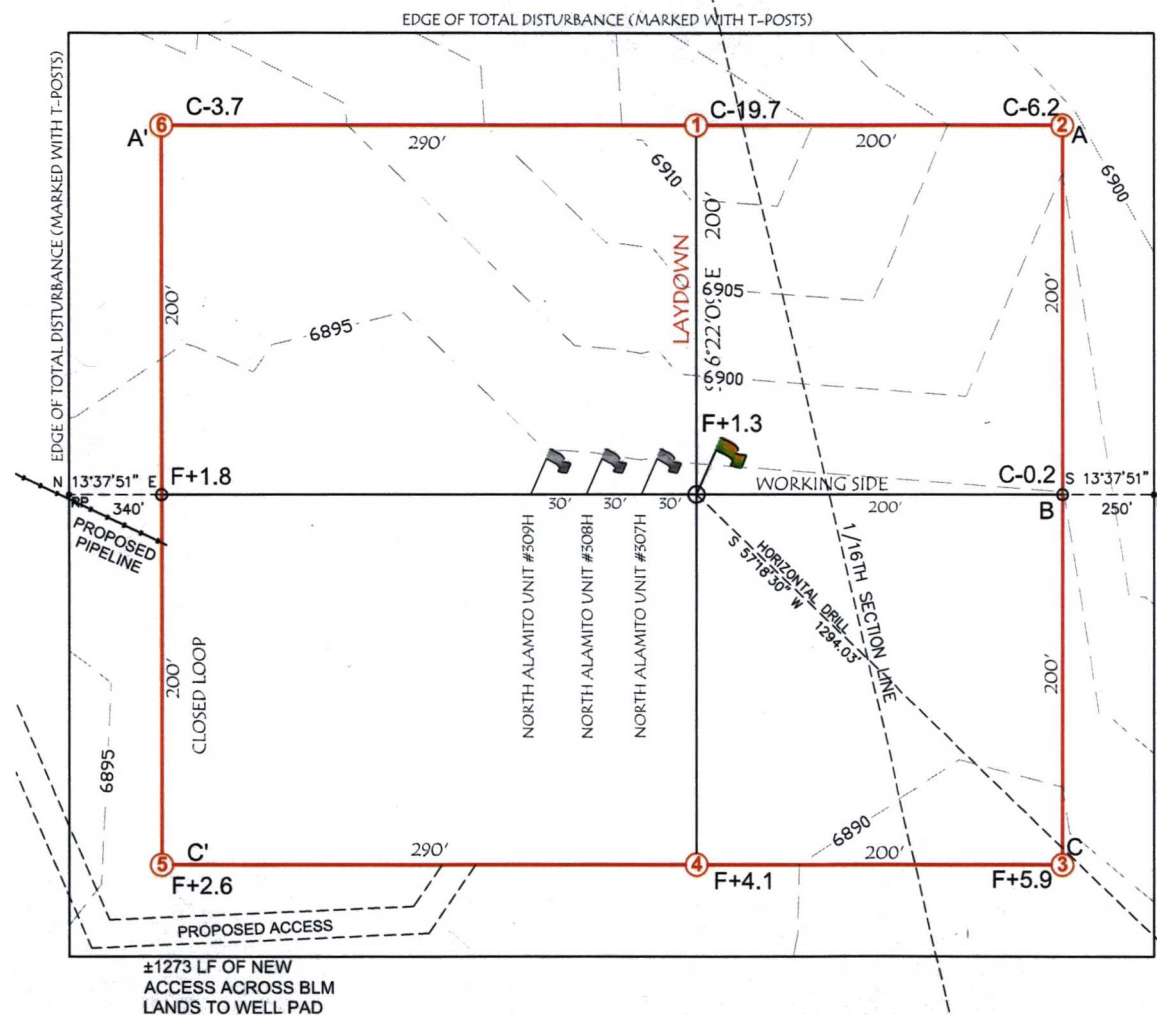
NOTES:

1.) BASIS OF BEARING: BETWEEN FOUND MONUMENTS AT THE SOUTHWEST CORNER AND THE WEST QUARTER CORNER OF SECTION 34, TOWNSHIP 23 NORTH, RANGE 7 WEST, N.M.P.M. SAN JUAN COUNTY, NEW MEXICO. LINE BEARS: N 00°13'57" W A DISTANCE OF 2672.64 FEET AS MEASURED BY G.P.S.

2.) LATITUDE, LONGITUDE AND ELLIPSOIDAL
HEIGHT BASED ON AZTEC CORS L1 PHASE
CENTER. DISTANCES SHOWN ARE GROUND
DISTANCES USING A TRAVERSE MERCATOR
PROJECTION FROM A WGS84 ELLIPSOID,
CONVERTED TO NAD83. NAVD88 ELEVATIONS AS
PREDICTED BY GEOID03.

3.) LOCATION OF UNDERGROUND UTILITIES
DEPICTED ARE APPROXIMATE. PRIOR TO
EXCAVATION UNDERGROUND UTILITIES SHOULD BE
FIELD VERIFIED. ALL CONSTRUCTION ACTIVITIES
SHOULD BE FIELD VERIFIED WITH NEW MEXICO
ONE-CALL AUTHORITIES AT LWEST 48 HOURS
PRIOR TO CONSTRUCTION.

4.) T-POSTS HAVE BEEN SET TO DEFINE THE EDGE OF DISTURBANCE LIMITS WHICH ARE 50' OFFSETS FROM THE EDGE OF THE STAKED WELL PAD.



SLOPES TO BE CONSTRUCTED
TO MATCH THE ORIGINAL
CONTOURS AS CLOSE AS
POSSIBLE.

~ SURFACE OWNERSHIP ~
BUREAU OF LAND MANAGEMENT

TOTAL PERMITTED AREA
500' x 590' = 6.77 ACRES
SCALE: 1" = 100'



JOB No.: NAU #306H_REV4
DATE: 11/01/16
DRAWN BY: GRR

NOTE:

CHENAULT CONSULTING, INC. IS NOT LIABLE FOR UNDERGROUND UTILITIES OR PIPELINES. CONTRACTOR SHOULD CALL ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED, BURIED PIPELINES OR CABLES ON WELL PAD, IN CONSTRUCTION ZONE AND/OR ACCESS ROAD AT LEAST TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION.

CCI

CHENAULT CONSULTING INC.

4800 COLLEGE BLVD.
SUITE 201
FARMINGTON, NM 87402
(505) 325-7707

WELL FLAG

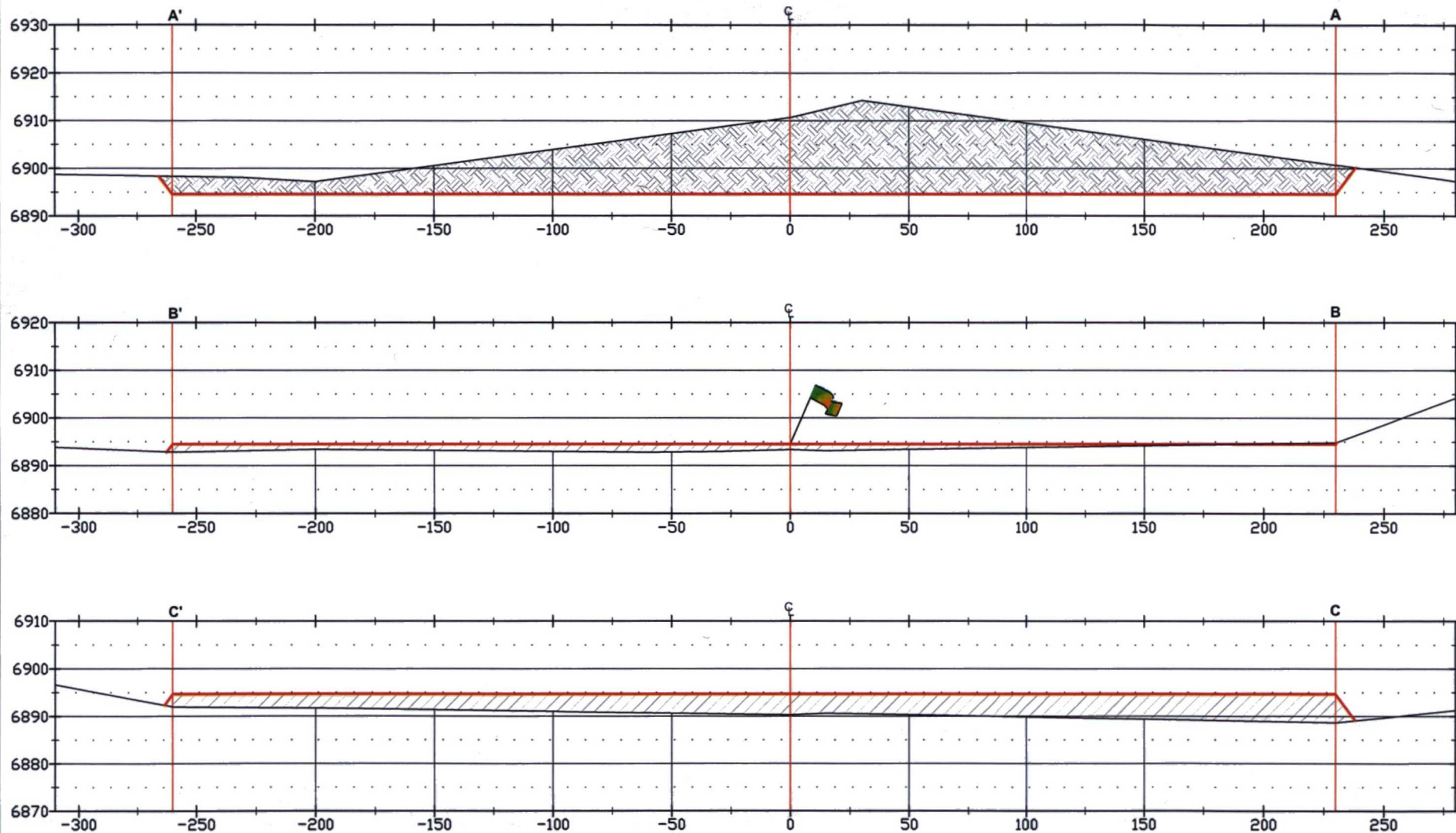
LATITUDE: 36.179682° N
LONGITUDE: 107.568393° W
DATUM: NAD83

ENCANA OIL & GAS (USA) INC.

NORTH ALAMITO UNIT 306H (FKA LYBROOK L34-2307 01H)

1403' FSL & 762' FWL
LOCATED IN THE NW/4 SW/4 OF SECTION 34, T23N, R7W, N.M.P.M.,
SANDOVAL COUNTY, NEW MEXICO
GROUND ELEVATION: 6893', NAVD 88
FINISHED PAD ELEVATION: 6894.6', NAVD 88

THIS DIAGRAM IS AN ESTIMATE
OF DIRT BALANCE AND IS NOT
INTENDED TO BE AN EXACT
MEASURE OF VOLUME



VERT. SCALE: 1" = 30'
HORZ. SCALE: 1" = 60'
JOB No.: NAU #306H_REV4
DATE: 11/01/16



CCI

CHENAULT CONSULTING INC.

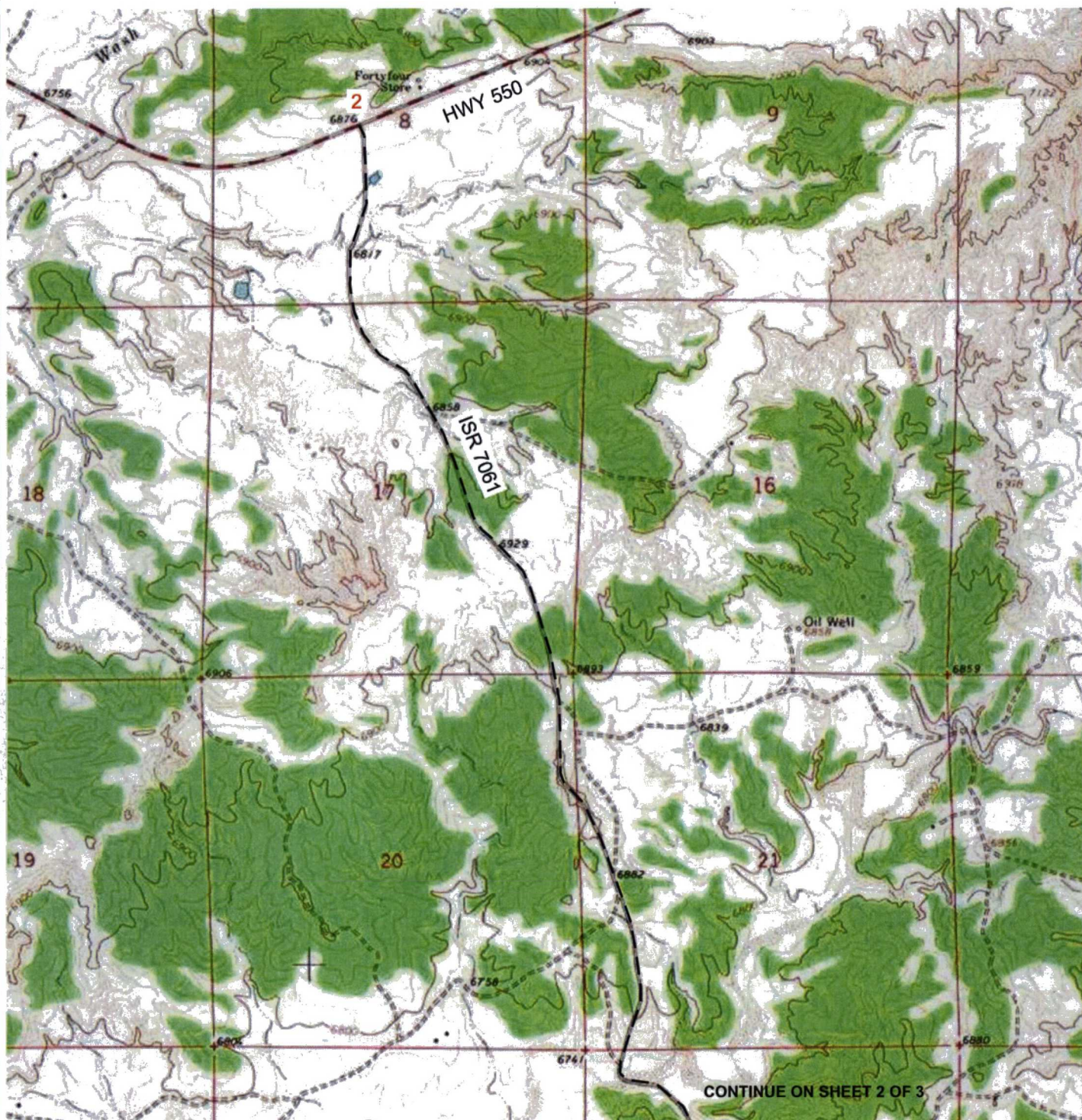
4800 COLLEGE BLVD.
SUITE 201
FARMINGTON, NM 87402
(505) 325-7707

WELL FLAG

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LONGITUDE: 107.568393° W
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1403' FSL & 762' FWL
LOCATED IN THE NW/4 SW/4 OF SECTION 34,
T23N, R7W, N.M.P.M.,
SANDOVAL COUNTY, NEW MEXICO
GROUND ELEVATION: 6893', NAVD 88
±1273' OF NEW ACCESS ACROSS BLM LANDS
PAGE 1 OF 3



U.S.G.S. QUAD: LYBROOK
SCALE: 1" = 2000' (1:24,000)
JOB No.: NAU #306H_REV4
DATE: 11/01/16

CCI**CHENAULT CONSULTING INC.**

4800 COLLEGE BLVD.
SUITE 201
FARMINGTON, NM 87402
(505)-325-7707

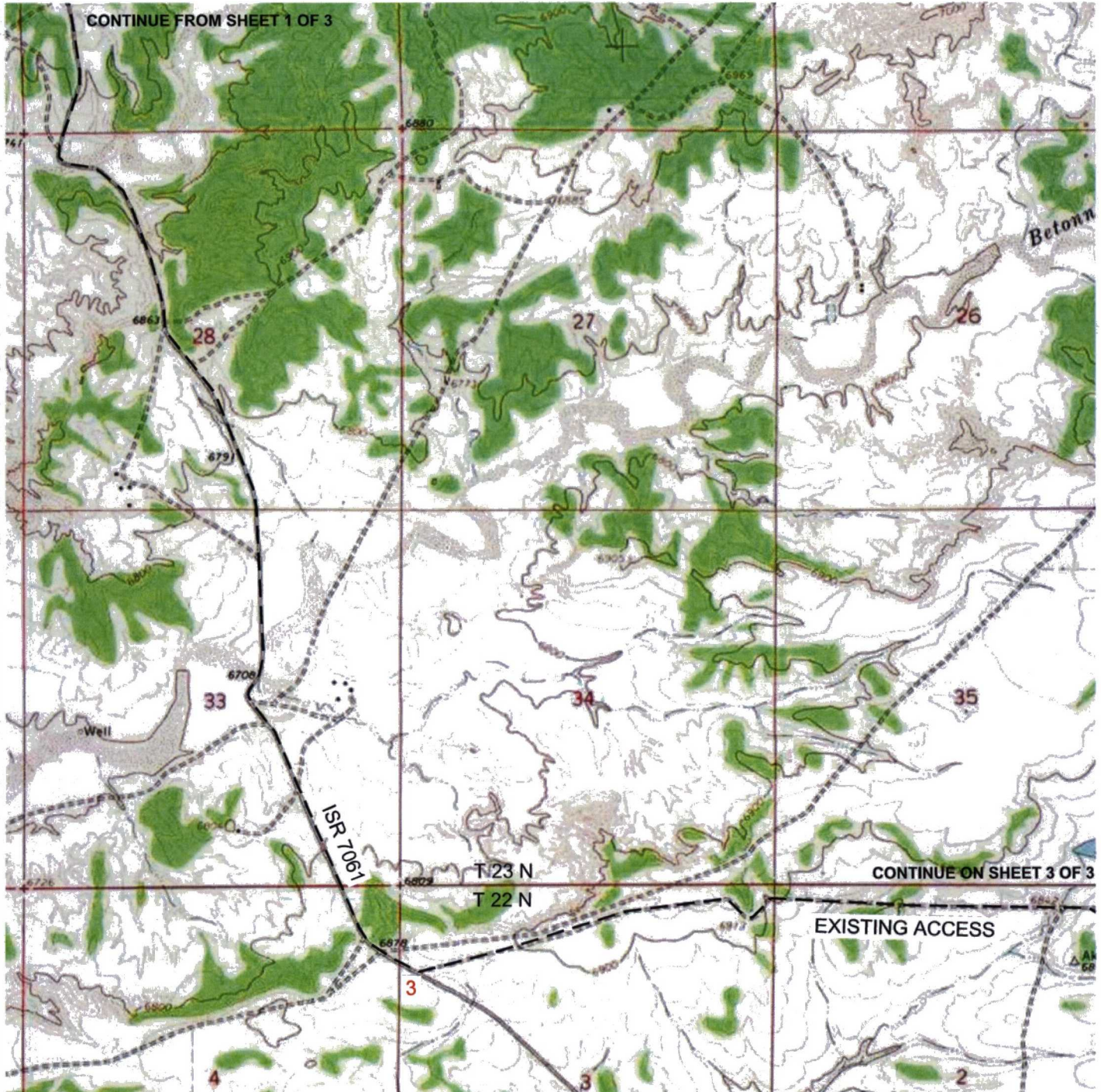
WELL FLAG

LATITUDE: 36.179682° N
LONGITUDE: 107.568393° W
DATUM: NAD83

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PAGE 2 OF 3



U.S.G.S. QUAD: LYBROOK
SCALE: 1" = 2000' (1:24,000)
JOB No.: NAU #306H_REV4
DATE: 11/01/16

CCI

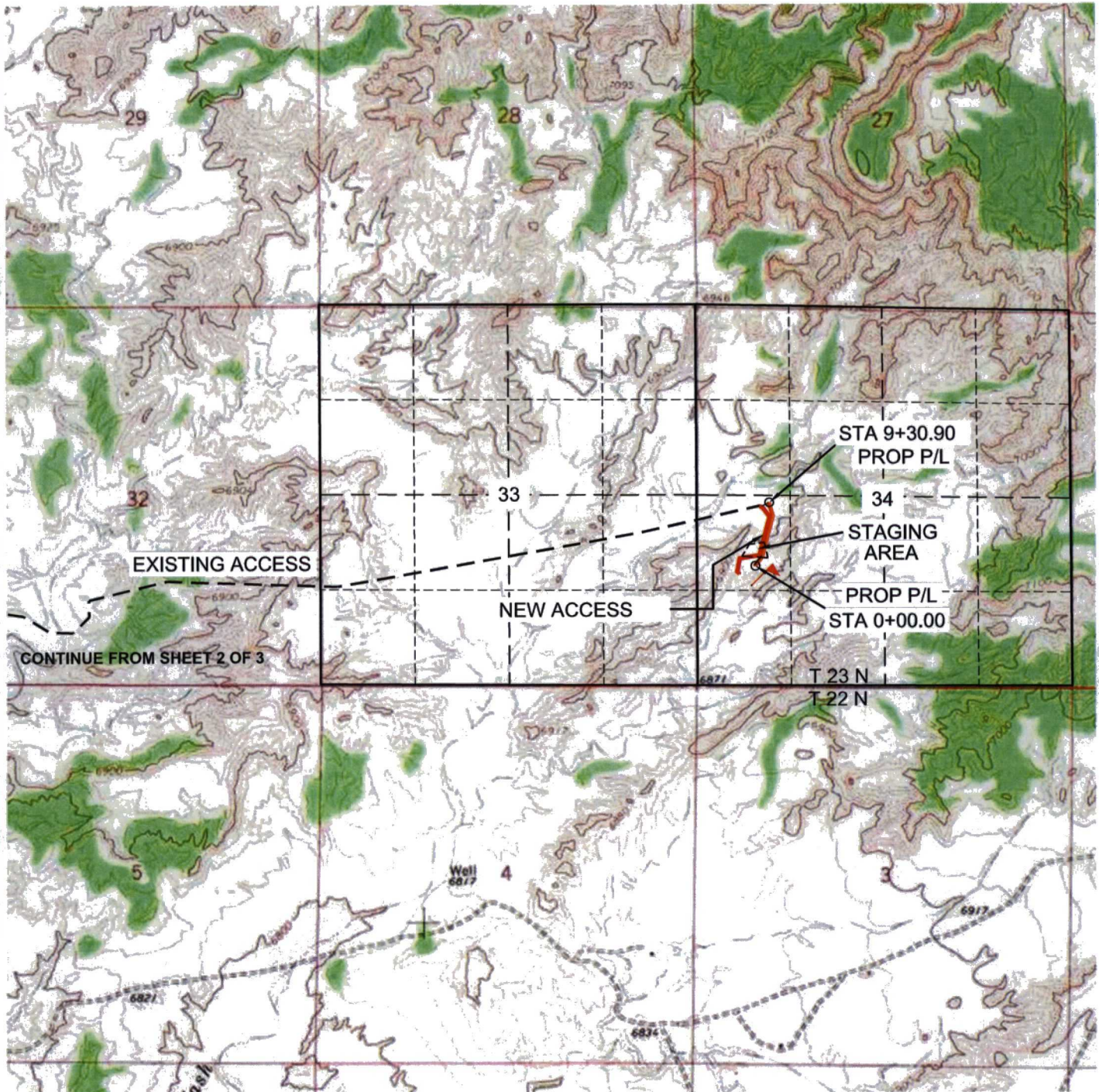
CHENAULT CONSULTING INC.

4800 COLLEGE BLVD.
SUITE 201
FARMINGTON, NM 87402
(505) 325-7707

WELL FLAG
LATITUDE: 36.179682° N
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DATUM: NAD83

ENCANA OIL & GAS (USA) INC.
NORTH ALAMITO UNIT 306H (FKA LYBROOK L34-2307 01H)

1403' FSL & 762' FWL
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±1273' OF NEW ACCESS ACROSS BLM LANDS
PAGE 3 OF 3



ENC-NORTH ALAMITO UNIT #306H
NEW ACCESS

STA. 0+00	24" CMP
STA. 1+62	24" CMP
STA. 8+24	24" CMP
STA. 10+04	24" CMP
STA. 12+72.60	24" CMP



U.S.G.S. QUAD: LYBROOK
SCALE: 1" = 2000' (1:24,000)
JOB No.: NAU #306H_REV4
DATE: 11/01/16

CCI

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ENCANA OIL & GAS (USA) INC.
NORTH ALAMITO UNIT 306H (FKA LYBROOK L34-2307 01H)

1403' FSL & 762' FWL
LOCATED IN THE NW/4 SW/4 OF SECTION 34,
T23N, R7W, N.M.P.M.,
SANDOVAL COUNTY, NEW MEXICO

DIRECTIONS

- 1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 39.0 MILES TO INDIAN ROUTE 7061 (M.P. 112.6).
- 2) TURN RIGHT AND GO 5.4 MILES.
- 3) TURN LEFT AND GO 6.3 MILES TO WHERE ACCESS IS STAKED ON 2-TRACK ON RIGHT SIDE OF ROAD.

WELL FLAG LOCATED AT LAT. 36.179682° N, LONG. 107.568393° W (NAD 83).



JOB No.: NAU #306H_REV4
DATE: 11/01/16

CCI

CHENAULT CONSULTING INC.

4800 COLLEGE BLVD.
SUITE 201
FARMINGTON, NM 87402
(505) 325-7707

PROPOSED ACCESS FOR
ENCANA OIL & GAS (USA) INC.

NORTH ALAMITO UNIT 306H (FKA LYBROOK L34-2307 01H)

LOCATED IN THE NW/4 SW/4 OF SECTION 34,

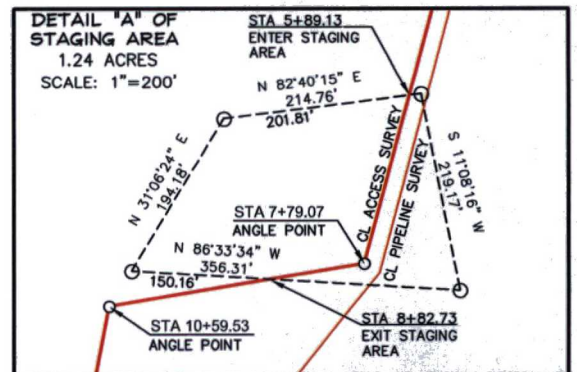
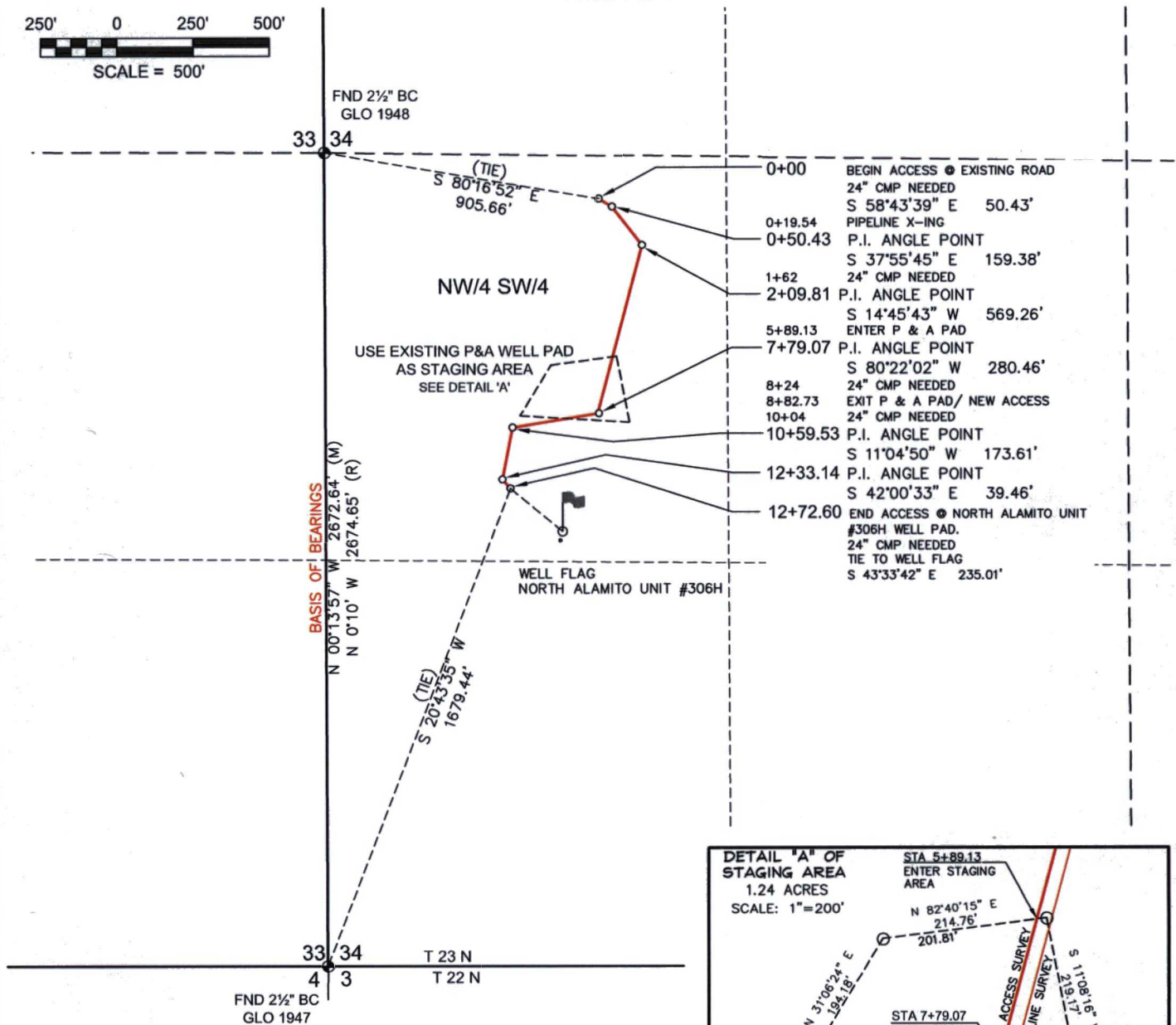
T23N, R7W, N.M.P.M.,

SANDOVAL COUNTY, NEW MEXICO

PAGE 1 OF 1



250' 0 250' 500'
SCALE = 500'



~ SURFACE OWNERSHIP ~	
BUREAU OF LAND MANAGEMENT	
SECTION 34, NW/4 SW/4	
0+00 TO 12+72.60	
1272.60 FT / 77.13 RODS	
DATE OF SURVEY	01/26/15 JPB

NOTES

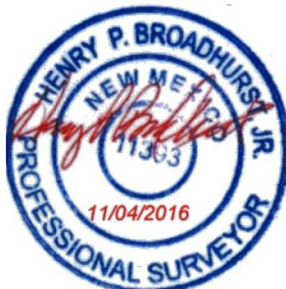
- 1) BASIS OF BEARINGS FOR THIS SURVEY ARE BETWEEN FOUND MONUMENTS AT THE SOUTHWEST CORNER AND THE WEST QUARTER CORNER OF SECTION 34, TOWNSHIP 23 NORTH, RANGE 7 WEST, N.M.P.M., SAN JUAN COUNTY, NEW MEXICO LINE BEARS: N 00°13'57" W 2672.64'
- 2) DATE OF FIELD SURVEY: JANUARY, 2015.
- 3) THIS EXHIBIT IS NOT A BOUNDARY SURVEY AND SHOULD NOT BE USED AS SUCH.
- 4) THIS EXHIBIT MAY NOT SHOW ALL EXISTING EASEMENTS AND UTILITIES.
- 5) CALL THE NEW MEXICO 811 SYSTEM FOR UTILITY LOCATIONS BEFORE EXCAVATING OR DIGGING.

PREPARED BY:

CCI

CHENAULT CONSULTING INC.

4800 COLLEGE BLVD #105
FARMINGTON, NM 87402
(505) 325-7707



I, HENRY P. BROADHURST, JR., A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

DRAWING: NAU #306H_REV4

SCALE: 1" = 500' REV. 4 11/01/2016

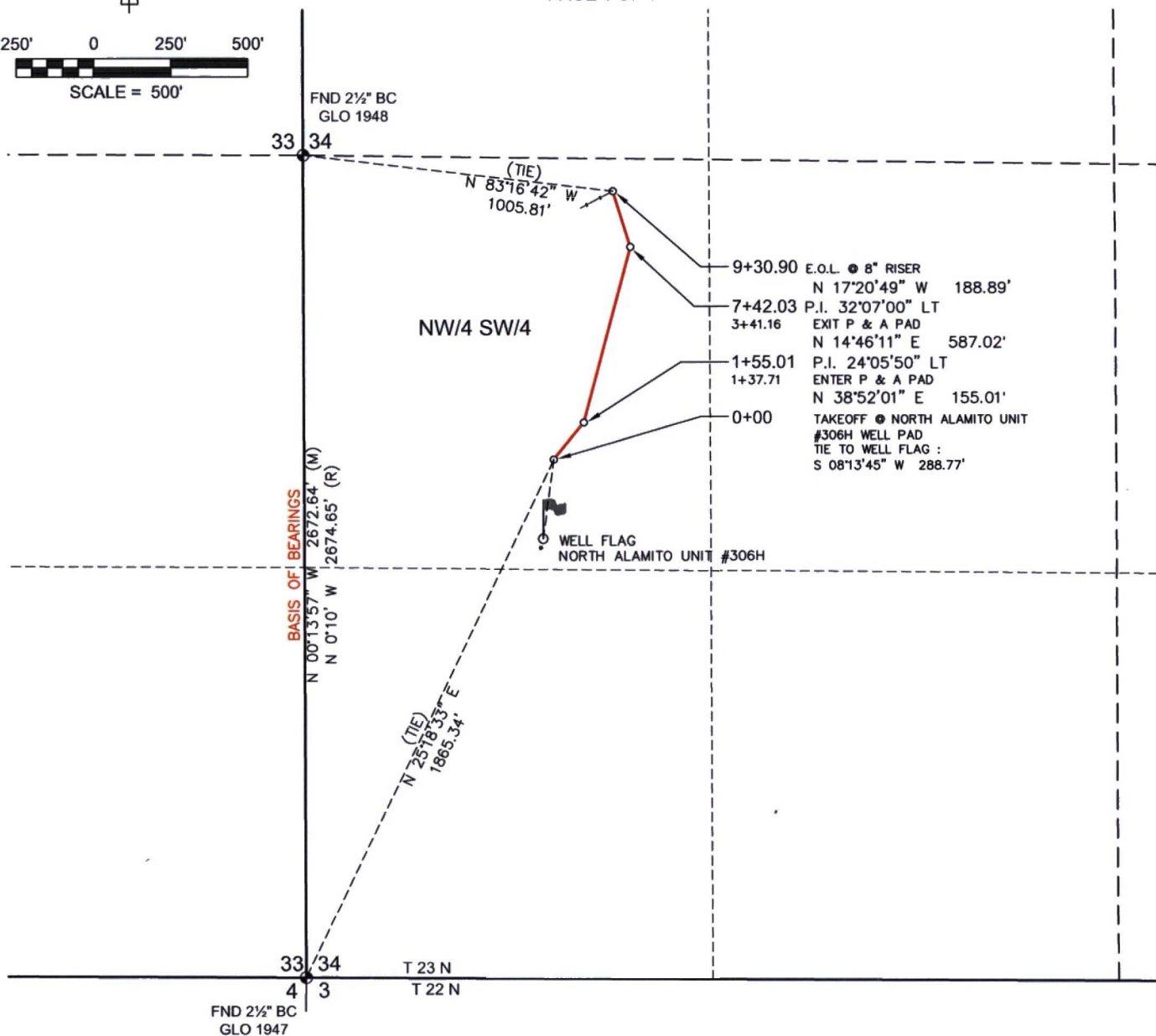
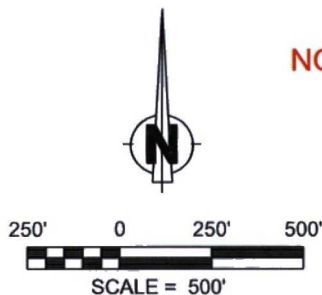
DRAFTED BY: GRR JOB# ENC152

SHEET: 1 of 1

PROPOSED PIPELINES FOR
ENCANA OIL & GAS (USA) INC.

NORTH ALAMITO UNIT 306H (FKA LYBROOK L34-2307 01H)

LOCATED IN THE NW/4 SW/4 OF SECTION 34,
T23N, R7W, N.M.P.M.,
SANDOVAL COUNTY, NEW MEXICO
PAGE 1 OF 1



NOTES

- 1) BASIS OF BEARINGS FOR THIS SURVEY ARE BETWEEN FOUND MONUMENTS AT THE SOUTHWEST CORNER AND THE WEST QUARTER CORNER OF SECTION 34, TOWNSHIP 23 NORTH, RANGE 7 WEST, N.M.P.M., SAN JUAN COUNTY, NEW MEXICO LINE BEARS: N 00°13'57" W 2672.64'
- 2) DATE OF FIELD SURVEY: JANUARY, 2015.
- 3) THIS EXHIBIT IS NOT A BOUNDARY SURVEY AND SHOULD NOT BE USED AS SUCH.
- 4) THIS EXHIBIT MAY NOT SHOW ALL EXISTING EASEMENTS AND UTILITIES.
- 5) CALL THE NEW MEXICO 811 SYSTEM FOR UTILITY LOCATIONS BEFORE EXCAVATING OR DIGGING.

PREPARED BY:

CCI

CHENAULT CONSULTING INC.

4800 COLLEGE BLVD #105
FARMINGTON, NM 87402
(505) 325-7707

I, HENRY P. BROADHURST, JR., A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.



~ SURFACE OWNERSHIP ~		
BUREAU OF LAND MANAGEMENT		
SECTION 34, NW/4 SW/4		
0+00 TO 9+30.90		
930.90 FT / 56.42 RODS		
DATE OF SURVEY	01/26/15	JPB

DRAWING: NAU #306H_REV4

SCALE: 1" = 500'

REV. 4 11/01/2016

DRAFTED BY: GRR

JOB# ENC152

SHEET: 1 of 1



Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 306H
Wellbore: OH
Design: PLAN #2



Azimuths to True North
Magnetic North: 9.10°

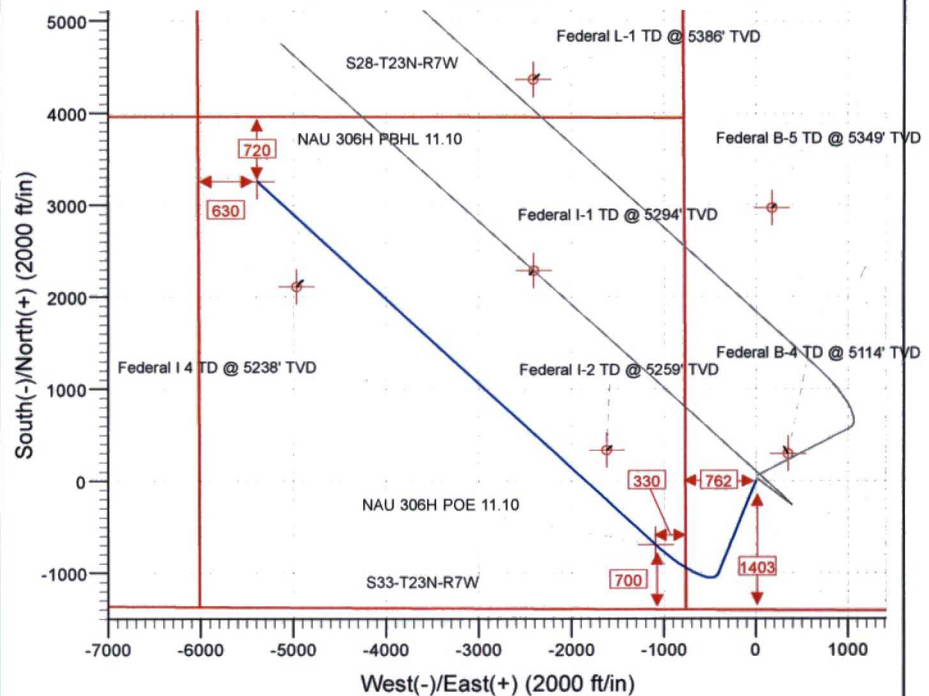
Magnetic Field
Strength: 49776.3nT
Dip Angle: 62.92°
Date: 9/9/2015
Model: HDGM

SECTION DETAILS

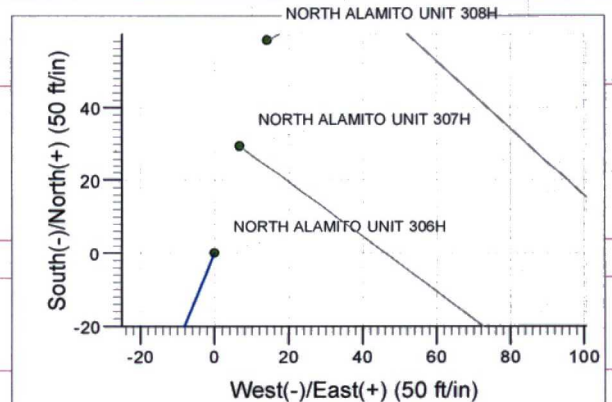
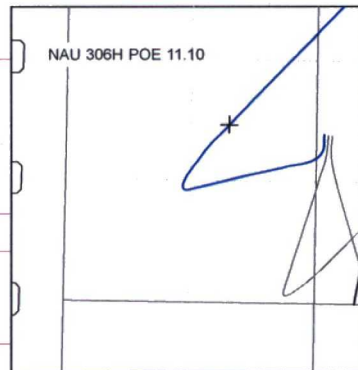
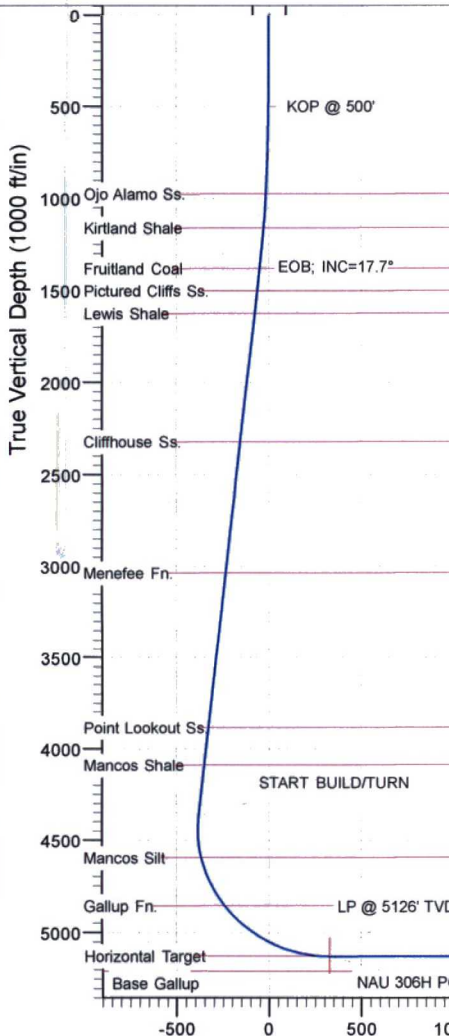
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	1385.1	17.70	202.17	1371.1	-125.6	-51.2	2.00	202.17	-47.3	
4	4530.6	17.70	202.17	4367.6	-1011.3	-412.1	0.00	0.00	-380.8	
5	5732.8	90.10	312.58	5126.4	-696.1	-1091.2	8.00	109.49	332.5	NAU 306H POE 11.10
6	11567.1	90.10	312.58	5116.2	3251.4	-5387.3	0.00	0.00	6166.8	NAU 306H PBHL 11.10

PLAN #2
NORTH ALAMITO UNIT 306H
15XXX LR
10' NS @ 6011.02
Ground Level @ 6895.0
North American Datum 1983
Well NORTH ALAMITO UNIT 306H, True North

Name	Type	Target	No Target (Freehand)	Azimuth	Origin	Type	N/S	E/W	From TVD	0.0
NAU 306H PBHL 11.10	TVD			312.58						
NAU 306H POE 11.10				312.58						
Federal I-4 TD @ 5238' TVD				312.58						
Federal I-2 TD @ 5259' TVD				312.58						
Federal I-1 TD @ 5294' TVD				312.58						
Federal B-5 TD @ 5349' TVD				312.58						
Federal B-4 TD @ 5114' TVD				312.58						
Federal L-1 TD @ 5386' TVD				312.58						



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
976.0	978.2	Ojo Alamo Ss.
1161.0	1167.1	Kirtland Shale
1381.1	1395.6	Fruitland Coal
1503.1	1523.7	Pictured Cliffs Ss.
1626.1	1652.8	Lewis Shale
2323.3	2384.6	Cliffhouse Ss.
3037.4	3134.2	Menefee Fn.
3885.6	4024.6	Point Lookout Ss.
4092.6	4241.9	Mancos Shale
4598.6	4773.3	Mancos Silt
4858.4	5075.9	Gallup Fn.



Vertical Section at 312.58° (1000 ft/in)

WELL DETAILS: NORTH ALAMITO UNIT 306H

+N/-S	+E/-W	Northing	Ground Level:	6895.0	Latitude	Longitude
0.0	0.0	1887316.46	Easting	1251337.68	36.179682	-107.568393



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well NORTH ALAMITO UNIT 306H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	16' KB @ 6911.0ft
Project:	Sandoval County, NM	MD Reference:	16' KB @ 6911.0ft
Site:	S34-T23N-R7W	North Reference:	True
Well:	NORTH ALAMITO UNIT 306H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #2		

Project	Sandoval County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	S34-T23N-R7W				
Site Position:		Northing:	1,887,404.69 ft	Latitude:	36.179925
From:	Lat/Long	Easting:	1,251,356.59 ft	Longitude:	-107.568333
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.78 °

Well		NORTH ALAMITO UNIT 306H				
Well Position	+N/-S	0.0 ft	Northing:	1,887,316.46 ft	Latitude:	36.179682
	+E/-W	0.0 ft	Easting:	1,251,337.68 ft	Longitude:	-107.568393
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	6,895.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/9/2015	9.10	62.92	49,776

Design	PLAN #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	312.58

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,385.1	17.70	202.17	1,371.1	-125.6	-51.2	2.00	2.00	0.00	202.17	
4,530.6	17.70	202.17	4,367.6	-1,011.3	-412.1	0.00	0.00	0.00	0.00	
5,732.8	90.10	312.58	5,126.4	-696.1	-1,091.2	8.00	6.02	9.18	109.49	NAU 306H POE 11.10
11,567.1	90.10	312.58	5,116.2	3,251.4	-5,387.3	0.00	0.00	0.00	0.00	NAU 306H PBHL 11.1

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 306H
Wellbore: OH
Design: PLAN #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well NORTH ALAMITO UNIT 306H
16' KB @ 6911.0ft
16' KB @ 6911.0ft
True
Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	KOP @ 500'
600.0	2.00	202.17	600.0	-1.6	-0.7	-0.6	2.00	2.00	
700.0	4.00	202.17	699.8	-6.5	-2.6	-2.4	2.00	2.00	
800.0	6.00	202.17	799.5	-14.5	-5.9	-5.5	2.00	2.00	
900.0	8.00	202.17	898.7	-25.8	-10.5	-9.7	2.00	2.00	
978.2	9.56	202.17	976.0	-36.9	-15.0	-13.9	2.00	2.00	Ojo Alamo Ss.
1,000.0	10.00	202.17	997.5	-40.3	-16.4	-15.2	2.00	2.00	
1,100.0	12.00	202.17	1,095.6	-58.0	-23.6	-21.8	2.00	2.00	
1,167.1	13.34	202.17	1,161.0	-71.6	-29.2	-27.0	2.00	2.00	Kirtland Shale
1,200.0	14.00	202.17	1,193.1	-78.8	-32.1	-29.7	2.00	2.00	
1,300.0	16.00	202.17	1,289.6	-102.8	-41.9	-38.7	2.00	2.00	
1,385.1	17.70	202.17	1,371.1	-125.6	-51.2	-47.3	2.00	2.00	EOB; INC=17.7°
1,395.6	17.70	202.17	1,381.1	-128.6	-52.4	-48.4	0.00	0.00	Fruitland Coal
1,400.0	17.70	202.17	1,385.3	-129.8	-52.9	-48.9	0.00	0.00	
1,500.0	17.70	202.17	1,480.5	-158.0	-64.4	-59.5	0.00	0.00	
1,523.7	17.70	202.17	1,503.1	-164.6	-67.1	-62.0	0.00	0.00	Pictured Cliffs Ss.
1,600.0	17.70	202.17	1,575.8	-186.1	-75.8	-70.1	0.00	0.00	
1,652.8	17.70	202.17	1,626.1	-201.0	-81.9	-75.7	0.00	0.00	Lewis Shale
1,700.0	17.70	202.17	1,671.1	-214.3	-87.3	-80.7	0.00	0.00	
1,800.0	17.70	202.17	1,766.3	-242.4	-98.8	-91.3	0.00	0.00	
1,900.0	17.70	202.17	1,861.6	-270.6	-110.3	-101.9	0.00	0.00	
2,000.0	17.70	202.17	1,956.9	-298.8	-121.7	-112.5	0.00	0.00	
2,100.0	17.70	202.17	2,052.1	-326.9	-133.2	-123.1	0.00	0.00	
2,200.0	17.70	202.17	2,147.4	-355.1	-144.7	-133.7	0.00	0.00	
2,300.0	17.70	202.17	2,242.7	-383.2	-156.2	-144.3	0.00	0.00	
2,384.6	17.70	202.17	2,323.3	-407.1	-165.9	-153.3	0.00	0.00	Cliffhouse Ss.
2,400.0	17.70	202.17	2,337.9	-411.4	-167.6	-154.9	0.00	0.00	
2,500.0	17.70	202.17	2,433.2	-439.5	-179.1	-165.5	0.00	0.00	
2,600.0	17.70	202.17	2,528.5	-467.7	-190.6	-176.1	0.00	0.00	
2,700.0	17.70	202.17	2,623.7	-495.9	-202.1	-186.7	0.00	0.00	
2,800.0	17.70	202.17	2,719.0	-524.0	-213.5	-197.3	0.00	0.00	
2,900.0	17.70	202.17	2,814.3	-552.2	-225.0	-207.9	0.00	0.00	
3,000.0	17.70	202.17	2,909.5	-580.3	-236.5	-218.5	0.00	0.00	
3,100.0	17.70	202.17	3,004.8	-608.5	-248.0	-229.1	0.00	0.00	
3,134.2	17.70	202.17	3,037.4	-618.1	-251.9	-232.8	0.00	0.00	Menefee Fn.
3,200.0	17.70	202.17	3,100.1	-636.7	-259.4	-239.7	0.00	0.00	
3,300.0	17.70	202.17	3,195.3	-664.8	-270.9	-250.3	0.00	0.00	
3,400.0	17.70	202.17	3,290.6	-693.0	-282.4	-261.0	0.00	0.00	
3,500.0	17.70	202.17	3,385.9	-721.1	-293.9	-271.6	0.00	0.00	
3,600.0	17.70	202.17	3,481.1	-749.3	-305.3	-282.2	0.00	0.00	
3,700.0	17.70	202.17	3,576.4	-777.4	-316.8	-292.8	0.00	0.00	
3,800.0	17.70	202.17	3,671.7	-805.6	-328.3	-303.4	0.00	0.00	
3,900.0	17.70	202.17	3,766.9	-833.8	-339.8	-314.0	0.00	0.00	
4,000.0	17.70	202.17	3,862.2	-861.9	-351.2	-324.6	0.00	0.00	
4,024.6	17.70	202.17	3,885.6	-868.8	-354.0	-327.2	0.00	0.00	Point Lookout Ss.
4,100.0	17.70	202.17	3,957.5	-890.1	-362.7	-335.2	0.00	0.00	
4,200.0	17.70	202.17	4,052.7	-918.2	-374.2	-345.8	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 306H
Wellbore: OH
Design: PLAN #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well NORTH ALAMITO UNIT 306H
16' KB @ 6911.0ft
16' KB @ 6911.0ft
True
Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,241.9	17.70	202.17	4,092.6	-930.0	-379.0	-350.2	0.00	0.00	Mancos Shale
4,300.0	17.70	202.17	4,148.0	-946.4	-385.6	-356.4	0.00	0.00	
4,400.0	17.70	202.17	4,243.2	-974.5	-397.1	-367.0	0.00	0.00	
4,500.0	17.70	202.17	4,338.5	-1,002.7	-408.6	-377.6	0.00	0.00	START BUILD/TURN
4,530.6	17.70	202.17	4,367.6	-1,011.3	-412.1	-380.8	0.00	0.00	
4,600.0	16.66	220.73	4,434.0	-1,028.6	-422.6	-384.8	8.00	-1.49	
4,700.0	18.21	247.15	4,529.6	-1,045.6	-446.4	-378.8	8.00	1.55	Mancos Silt
4,773.3	21.22	262.16	4,598.6	-1,051.9	-470.1	-365.6	8.00	4.10	
4,800.0	22.59	266.56	4,623.4	-1,052.8	-480.0	-358.9	8.00	5.11	
4,900.0	28.51	279.13	4,713.6	-1,050.2	-522.8	-325.6	8.00	5.92	Gallup Fn.
5,000.0	35.21	287.46	4,798.6	-1,037.7	-574.0	-279.5	8.00	6.70	
5,075.9	40.57	292.10	4,858.4	-1,021.9	-617.7	-236.6	8.00	7.07	
5,100.0	42.31	293.36	4,876.5	-1,015.7	-632.5	-221.5	8.00	7.21	
5,200.0	49.65	297.82	4,946.0	-984.5	-697.2	-152.8	8.00	7.33	
5,300.0	57.12	301.39	5,005.6	-944.8	-766.8	-74.6	8.00	7.47	
5,400.0	64.67	304.41	5,054.2	-897.3	-840.1	11.4	8.00	7.56	
5,500.0	72.28	307.06	5,090.9	-843.0	-915.5	103.7	8.00	7.61	
5,600.0	79.92	309.50	5,114.9	-782.9	-991.6	200.4	8.00	7.64	
5,700.0	87.58	311.83	5,125.7	-718.1	-1,066.9	299.7	8.00	7.66	LP @ 5126' TVD; 90.1°
5,732.8	90.10	312.58	5,126.4	-696.1	-1,091.2	332.5	8.00	7.67	
5,800.0	90.10	312.58	5,126.3	-650.6	-1,140.7	399.7	0.00	0.00	
5,900.0	90.10	312.58	5,126.1	-583.0	-1,214.3	499.7	0.00	0.00	
6,000.0	90.10	312.58	5,125.9	-515.3	-1,288.0	599.7	0.00	0.00	
6,100.0	90.10	312.58	5,125.8	-447.7	-1,361.6	699.7	0.00	0.00	
6,200.0	90.10	312.58	5,125.6	-380.0	-1,435.2	799.7	0.00	0.00	
6,300.0	90.10	312.58	5,125.4	-312.3	-1,508.9	899.7	0.00	0.00	
6,400.0	90.10	312.58	5,125.2	-244.7	-1,582.5	999.7	0.00	0.00	
6,500.0	90.10	312.58	5,125.1	-177.0	-1,656.1	1,099.7	0.00	0.00	
6,600.0	90.10	312.58	5,124.9	-109.4	-1,729.8	1,199.7	0.00	0.00	
6,700.0	90.10	312.58	5,124.7	-41.7	-1,803.4	1,299.7	0.00	0.00	
6,800.0	90.10	312.58	5,124.5	26.0	-1,877.1	1,399.7	0.00	0.00	
6,900.0	90.10	312.58	5,124.4	93.6	-1,950.7	1,499.7	0.00	0.00	
7,000.0	90.10	312.58	5,124.2	161.3	-2,024.3	1,599.7	0.00	0.00	
7,100.0	90.10	312.58	5,124.0	228.9	-2,098.0	1,699.7	0.00	0.00	
7,200.0	90.10	312.58	5,123.8	296.6	-2,171.6	1,799.7	0.00	0.00	
7,300.0	90.10	312.58	5,123.7	364.3	-2,245.2	1,899.7	0.00	0.00	
7,400.0	90.10	312.58	5,123.5	431.9	-2,318.9	1,999.7	0.00	0.00	
7,500.0	90.10	312.58	5,123.3	499.6	-2,392.5	2,099.7	0.00	0.00	
7,600.0	90.10	312.58	5,123.2	567.2	-2,466.1	2,199.7	0.00	0.00	
7,700.0	90.10	312.58	5,123.0	634.9	-2,539.8	2,299.7	0.00	0.00	
7,800.0	90.10	312.58	5,122.8	702.6	-2,613.4	2,399.7	0.00	0.00	
7,900.0	90.10	312.58	5,122.6	770.2	-2,687.0	2,499.7	0.00	0.00	
8,000.0	90.10	312.58	5,122.5	837.9	-2,760.7	2,599.7	0.00	0.00	
8,100.0	90.10	312.58	5,122.3	905.5	-2,834.3	2,699.7	0.00	0.00	
8,200.0	90.10	312.58	5,122.1	973.2	-2,907.9	2,799.7	0.00	0.00	
8,300.0	90.10	312.58	5,121.9	1,040.9	-2,981.6	2,899.7	0.00	0.00	
8,400.0	90.10	312.58	5,121.8	1,108.5	-3,055.2	2,999.7	0.00	0.00	
8,500.0	90.10	312.58	5,121.6	1,176.2	-3,128.8	3,099.7	0.00	0.00	
8,600.0	90.10	312.58	5,121.4	1,243.8	-3,202.5	3,199.7	0.00	0.00	
8,700.0	90.10	312.58	5,121.2	1,311.5	-3,276.1	3,299.7	0.00	0.00	
8,800.0	90.10	312.58	5,121.1	1,379.2	-3,349.8	3,399.7	0.00	0.00	
8,900.0	90.10	312.58	5,120.9	1,446.8	-3,423.4	3,499.7	0.00	0.00	

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: S34-T23N-R7W
 Well: NORTH ALAMITO UNIT 306H
 Wellbore: OH
 Design: PLAN #2

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well NORTH ALAMITO UNIT 306H
 16' KB @ 6911.0ft
 16' KB @ 6911.0ft
 True
 Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
9,000.0	90.10	312.58	5,120.7	1,514.5	-3,497.0	3,599.7	0.00	0.00	
9,100.0	90.10	312.58	5,120.5	1,582.1	-3,570.7	3,699.7	0.00	0.00	
9,200.0	90.10	312.58	5,120.4	1,649.8	-3,644.3	3,799.7	0.00	0.00	
9,300.0	90.10	312.58	5,120.2	1,717.5	-3,717.9	3,899.7	0.00	0.00	
9,400.0	90.10	312.58	5,120.0	1,785.1	-3,791.6	3,999.7	0.00	0.00	
9,500.0	90.10	312.58	5,119.8	1,852.8	-3,865.2	4,099.7	0.00	0.00	
9,600.0	90.10	312.58	5,119.7	1,920.4	-3,938.8	4,199.7	0.00	0.00	
9,700.0	90.10	312.58	5,119.5	1,988.1	-4,012.5	4,299.7	0.00	0.00	
9,800.0	90.10	312.58	5,119.3	2,055.8	-4,086.1	4,399.7	0.00	0.00	
9,900.0	90.10	312.58	5,119.1	2,123.4	-4,159.7	4,499.7	0.00	0.00	
10,000.0	90.10	312.58	5,119.0	2,191.1	-4,233.4	4,599.7	0.00	0.00	
10,100.0	90.10	312.58	5,118.8	2,258.7	-4,307.0	4,699.7	0.00	0.00	
10,200.0	90.10	312.58	5,118.6	2,326.4	-4,380.6	4,799.7	0.00	0.00	
10,300.0	90.10	312.58	5,118.4	2,394.1	-4,454.3	4,899.7	0.00	0.00	
10,400.0	90.10	312.58	5,118.3	2,461.7	-4,527.9	4,999.7	0.00	0.00	
10,500.0	90.10	312.58	5,118.1	2,529.4	-4,601.6	5,099.7	0.00	0.00	
10,600.0	90.10	312.58	5,117.9	2,597.0	-4,675.2	5,199.7	0.00	0.00	
10,700.0	90.10	312.58	5,117.7	2,664.7	-4,748.8	5,299.7	0.00	0.00	
10,800.0	90.10	312.58	5,117.6	2,732.4	-4,822.5	5,399.7	0.00	0.00	
10,900.0	90.10	312.58	5,117.4	2,800.0	-4,896.1	5,499.7	0.00	0.00	
11,000.0	90.10	312.58	5,117.2	2,867.7	-4,969.7	5,599.7	0.00	0.00	
11,100.0	90.10	312.58	5,117.0	2,935.3	-5,043.4	5,699.7	0.00	0.00	
11,200.0	90.10	312.58	5,116.9	3,003.0	-5,117.0	5,799.7	0.00	0.00	
11,300.0	90.10	312.58	5,116.7	3,070.7	-5,190.6	5,899.7	0.00	0.00	
11,400.0	90.10	312.58	5,116.5	3,138.3	-5,264.3	5,999.7	0.00	0.00	
11,500.0	90.10	312.58	5,116.3	3,206.0	-5,337.9	6,099.7	0.00	0.00	
11,567.1	90.10	312.58	5,116.2	3,251.4	-5,387.3	6,166.8	0.00	0.00	TD at 11567.1

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 306H
Wellbore: OH
Design: PLAN #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well NORTH ALAMITO UNIT 306H
16' KB @ 6911.0ft
16' KB @ 6911.0ft
True
Minimum Curvature

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Federal B-5 TD @ 5349' - plan misses target center by 3559.2ft at 7276.2ft MD (5123.7 TVD, 348.1 N, -2227.7 E) - Circle (radius 50.0)	0.00	0.00	5,365.7	2,963.1	174.6	1,890,276.94	1,251,552.50	36.187821	-107.567801
Federal I-2 TD @ 5259' - plan misses target center by 428.6ft at 6818.1ft MD (5124.5 TVD, 38.2 N, -1890.3 E) - Circle (radius 50.0)	0.00	0.00	5,275.4	333.8	-1,619.1	1,887,672.19	1,249,723.26	36.180599	-107.573879
NAU 306H POE 11.10 - plan hits target center - Point	0.00	0.00	5,126.4	-696.1	-1,091.2	1,886,635.26	1,250,237.08	36.177770	-107.572090
NAU 306H PBHL 11.10 - plan hits target center - Point	0.00	0.00	5,116.2	3,251.4	-5,387.3	1,890,640.71	1,245,995.07	36.188611	-107.586647
Federal B-4 TD @ 5114' - plan misses target center by 1653.1ft at 4976.6ft MD (4779.3 TVD, -1041.5 N, -561.3 E) - Circle (radius 50.0)	0.00	0.00	5,130.2	294.5	346.8	1,887,606.22	1,251,688.45	36.180491	-107.567218
Federal I-1 TD @ 5294' - plan misses target center by 1320.9ft at 8716.7ft MD (5121.2 TVD, 1322.8 N, -3288.4 E) - Circle (radius 50.0)	0.00	0.00	5,310.5	2,285.6	-2,404.1	1,889,634.54	1,248,964.84	36.185960	-107.576539
Federal I 4 TD @ 5238' - plan misses target center by 568.2ft at 10480.1ft MD (5118.1 TVD, 2515.9 N, -4586.9 E) - Circle (radius 50.0)	0.00	0.00	5,254.8	2,110.0	-4,960.2	1,889,493.66	1,246,406.62	36.185476	-107.585199
Federal L-1 TD @ 5386' - plan misses target center by 2849.6ft at 10124.8ft MD (5118.7 TVD, 2275.5 N, -4325.3 E) - Circle (radius 50.0)	0.00	0.00	5,402.3	4,363.7	-2,407.2	1,891,712.49	1,248,989.99	36.191667	-107.576550

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
978.2	976.0	Ojo Alamo Ss.		-0.10	312.58
1,167.1	1,161.0	Kirtland Shale		-0.10	312.58
1,395.6	1,381.0	Fruitland Coal		-0.10	312.58
1,523.7	1,503.0	Pictured Cliffs Ss.		-0.10	312.58
1,652.8	1,626.0	Lewis Shale		-0.10	312.58
2,384.6	2,323.0	Cliffhouse Ss.		-0.10	312.58
3,134.2	3,037.0	Menefee Fn.		-0.10	312.58
4,024.6	3,885.0	Point Lookout Ss.		-0.10	312.58
4,241.9	4,092.0	Mancos Shale		-0.10	312.58
4,773.3	4,598.0	Mancos Silt		-0.10	312.58
5,075.9	4,858.0	Gallup Fn.		-0.10	312.58

Cathedral Energy Services

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Site: S34-T23N-R7W
Well: NORTH ALAMITO UNIT 306H
Wellbore: OH
Design: PLAN #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well NORTH ALAMITO UNIT 306H
 16' KB @ 6911.0ft
 16' KB @ 6911.0ft
 True
 Minimum Curvature

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
500.0	500.0	0.0	0.0	KOP @ 500'
1,385.1	1,371.1	-125.6	-51.2	EOB; INC=17.7°
4,530.6	4,367.6	-1,011.3	-412.1	START BUILD/TURN
5,732.8	5,126.4	-696.1	-1,091.2	LP @ 5126' TVD; 90.1°
11,567.1	5,116.2	3,251.4	-5,387.3	TD at 11567.1



EnCana Oil & Gas (USA) Inc

Sandoval County, NM

S34-T23N-R7W

NORTH ALAMITO UNIT 306H

OH

PLAN #2

Anticollision Report

10 November, 2016

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NORTH ALAMITO UNIT 306H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 6911.0ft
Reference Site:	S34-T23N-R7W	MD Reference:	16' KB @ 6911.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	NORTH ALAMITO UNIT 306H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2	Offset TVD Reference:	Offset Datum

Reference	PLAN #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	Systematic Ellipse
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,500.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 11/10/2016			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,567.1	PLAN #2 (OH)	MWD+HDGM	OWSG MWD + HDGM

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S34-T23N-R7W						
Federal B-4 (Existing) - INC ONLY - INC ONLY	504.1	488.7	476.7	474.2	188.477	CC, ES
Federal B-4 (Existing) - INC ONLY - INC ONLY	4,400.0	4,247.4	1,482.5	1,456.4	56.858	SF
Federal B-5 (Existing) - INC ONLY - INC ONLY						Out of range
Federal I-1 (Existing) - INC ONLY - SURVEYS	8,717.8	5,074.0	1,302.1	1,195.9	12.256	CC, ES
Federal I-1 (Existing) - INC ONLY - SURVEYS	8,900.0	5,073.2	1,314.8	1,206.2	12.102	SF
Federal I-2 (Existing) - INC ONLY - SURVEYS	6,817.8	5,119.2	404.8	346.4	6.925	CC, ES, SF
Federal I-4 (Existing) - EXISTING - SURVEYS	10,479.3	5,089.5	547.9	395.9	3.605	CC
Federal I-4 (Existing) - EXISTING - SURVEYS	10,500.0	5,089.6	548.2	395.4	3.588	ES, SF
Federal L-1 (Existing) - INC ONLY - SURVEYS						Out of range
NORTH ALAMITO UNIT 307H - OH - PLAN #1	500.0	500.0	30.3	27.1	9.549	CC, ES
NORTH ALAMITO UNIT 307H - OH - PLAN #1	11,567.1	11,516.5	1,285.8	943.1	3.752	SF
NORTH ALAMITO UNIT 308H - OH - PLAN #1	500.0	500.0	60.0	56.8	18.918	CC, ES
NORTH ALAMITO UNIT 308H - OH - PLAN #1	700.0	698.3	68.0	63.4	14.887	SF

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NORTH ALAMITO UNIT 306H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 6911.0ft
Reference Site:	S34-T23N-R7W	MD Reference:	16' KB @ 6911.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	NORTH ALAMITO UNIT 306H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2	Offset TVD Reference:	Offset Datum

Offset Design S34-T23N-R7W - Federal B-4 (Existing) - INC ONLY - INC ONLY														Offset Site Error:	0.0 ft
Survey Program: 150-ISCWSA MWD														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Between Centres (ft)	Between Ellipses (ft)							
0.0	0.0	0.0	0.0	0.0	0.0	39.72	367.0	304.9	477.4						
100.0	100.0	84.2	84.2	0.2	0.1	39.73	366.9	304.9	477.1	476.9	0.25	1,944.650			
200.0	200.0	184.4	184.4	0.5	0.2	39.75	366.8	305.0	477.0	476.3	0.76	631.774			
300.0	300.0	284.5	284.5	0.9	0.5	39.78	366.6	305.1	477.0	475.6	1.34	356.281			
400.0	400.0	384.6	384.6	1.2	0.7	39.81	366.3	305.3	476.8	474.9	1.92	248.053			
500.0	500.0	484.6	484.6	1.6	0.9	39.85	366.0	305.5	476.7	474.2	2.51	190.227			
504.1	504.1	488.7	488.7	1.6	0.9	-162.32	366.0	305.5	476.7	474.2	2.53	188.477 CC, ES			
600.0	600.0	584.7	584.7	1.9	1.1	-162.33	365.6	305.7	478.2	475.2	3.07	155.577			
700.0	699.8	684.7	684.7	2.3	1.4	-162.43	365.2	305.9	483.1	479.4	3.64	132.860			
800.0	799.5	784.5	784.5	2.6	1.6	-162.63	364.7	306.2	491.2	487.0	4.21	116.787			
900.0	898.7	884.0	884.0	3.0	1.8	-162.90	364.1	306.6	502.6	497.8	4.78	105.114			
1,000.0	997.5	983.0	982.9	3.3	2.0	-163.25	363.5	306.9	517.3	511.9	5.36	96.481			
1,100.0	1,095.6	1,081.4	1,081.4	3.7	2.3	-163.65	362.8	307.3	535.3	529.4	5.95	90.029			
1,200.0	1,193.1	1,179.1	1,179.0	4.2	2.5	-164.10	362.0	307.8	556.6	550.1	6.53	85.181			
1,300.0	1,289.6	1,276.0	1,275.9	4.6	2.7	-164.58	361.2	308.2	581.2	574.1	7.13	81.560			
1,385.1	1,371.1	1,357.7	1,357.6	5.0	2.9	-164.99	360.4	308.7	604.8	597.1	7.63	79.228			
1,400.0	1,385.3	1,371.9	1,371.9	5.1	2.9	-165.09	360.3	308.8	609.1	601.4	7.73	78.847			
1,500.0	1,480.5	1,467.6	1,467.6	5.6	3.1	-165.70	359.4	309.3	638.2	629.9	8.31	76.761			
1,600.0	1,575.8	1,563.3	1,563.2	6.1	3.4	-166.25	358.4	309.9	667.3	658.4	8.91	74.915			
1,700.0	1,671.1	1,659.0	1,658.9	6.6	3.6	-166.75	357.4	310.5	696.4	686.9	9.50	73.274			
1,800.0	1,766.3	1,754.7	1,754.6	7.1	3.8	-167.21	356.3	311.1	725.6	715.5	10.10	71.807			
1,900.0	1,861.6	1,850.4	1,850.4	7.7	4.0	-167.63	355.1	311.8	754.7	744.0	10.71	70.490			
2,000.0	1,956.9	1,946.2	1,946.1	8.2	4.2	-168.01	353.9	312.5	783.9	772.6	11.31	69.300			
2,100.0	2,052.1	2,042.0	2,041.9	8.7	4.4	-168.35	352.6	313.2	813.1	801.1	11.92	68.221			
2,200.0	2,147.4	2,137.8	2,137.7	9.3	4.7	-168.68	351.3	314.0	842.2	829.7	12.53	67.239			
2,300.0	2,242.7	2,233.6	2,233.5	9.8	4.9	-168.97	349.9	314.8	871.4	858.2	13.13	66.340			
2,400.0	2,337.9	2,329.3	2,329.2	10.4	5.1	-169.24	348.4	315.6	900.5	886.8	13.74	65.518			
2,500.0	2,433.2	2,424.9	2,424.8	10.9	5.3	-169.50	347.0	316.4	929.7	915.3	14.35	64.765			
2,600.0	2,528.5	2,520.5	2,520.3	11.5	5.5	-169.74	345.5	317.3	958.8	943.9	14.97	64.072			
2,700.0	2,623.7	2,616.1	2,615.9	12.0	5.7	-169.96	344.1	318.1	988.0	972.4	15.58	63.431			
2,800.0	2,719.0	2,711.6	2,711.4	12.6	6.0	-170.17	342.7	318.9	1,017.2	1,001.0	16.19	62.838			
2,900.0	2,814.3	2,807.2	2,807.0	13.2	6.2	-170.37	341.2	319.8	1,046.4	1,029.6	16.80	62.287			
3,000.0	2,909.5	2,902.8	2,902.6	13.7	6.4	-170.56	339.8	320.6	1,075.7	1,058.2	17.41	61.773			
3,100.0	3,004.8	2,999.0	2,998.7	14.3	6.6	-170.74	338.3	321.5	1,104.9	1,086.8	18.03	61.280			
3,200.0	3,100.1	3,095.2	3,094.9	14.8	6.8	-170.90	336.7	322.4	1,134.0	1,115.4	18.65	60.814			
3,300.0	3,195.3	3,191.4	3,191.1	15.4	7.1	-171.05	335.0	323.4	1,163.1	1,143.9	19.27	60.374			
3,400.0	3,290.6	3,287.6	3,287.4	15.9	7.3	-171.19	333.2	324.4	1,192.2	1,172.3	19.88	59.958			
3,500.0	3,385.9	3,383.3	3,383.0	16.5	7.5	-171.32	331.4	325.4	1,221.3	1,200.8	20.50	59.575			
3,600.0	3,481.1	3,478.9	3,478.6	17.1	7.7	-171.45	329.6	326.5	1,250.3	1,229.2	21.12	59.213			
3,700.0	3,576.4	3,574.6	3,574.2	17.6	7.9	-171.56	327.8	327.5	1,279.4	1,257.7	21.73	58.872			
3,800.0	3,671.6	3,670.2	3,669.9	18.2	8.1	-171.68	326.0	328.6	1,308.5	1,286.1	22.35	58.550			
3,900.0	3,766.9	3,766.0	3,765.6	18.7	8.4	-171.78	324.2	329.6	1,337.6	1,314.6	22.97	58.242			
4,000.0	3,862.2	3,862.2	3,861.8	19.3	8.6	-171.88	322.3	330.7	1,366.6	1,343.0	23.59	57.941			
4,100.0	3,957.4	3,958.5	3,958.0	19.9	8.8	-171.98	320.4	331.8	1,395.6	1,371.4	24.21	57.653			
4,200.0	4,052.7	4,054.8	4,054.3	20.4	9.0	-172.07	318.4	333.0	1,424.6	1,399.8	24.83	57.377			
4,300.0	4,148.0	4,151.1	4,150.6	21.0	9.3	-172.15	316.3	334.2	1,453.6	1,428.1	25.45	57.113			
4,400.0	4,243.2	4,247.4	4,246.9	21.6	9.5	-172.22	314.1	335.4	1,482.5	1,456.4	26.07	56.858 SF			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 306H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #2

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 306H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design S34-T23N-R7W - Federal I-1 (Existing) - INC ONLY - SURVEYS												Offset Site Error:	0.0 ft
Survey Program: 525-ISCWSA MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis		Separation Factor
8,000.0	5,122.5	5,077.5	5,077.1	77.8	10.9	88.76	2,282.1	-2,408.4	1,486.9	1,403.0	83.90	17.722	
8,100.0	5,122.3	5,077.0	5,076.6	80.3	10.9	88.74	2,282.1	-2,408.4	1,441.3	1,353.7	87.60	16.453	
8,200.0	5,122.1	5,076.6	5,076.1	82.9	10.9	88.72	2,282.1	-2,408.4	1,401.3	1,310.1	91.26	15.355	
8,300.0	5,121.9	5,076.1	5,075.6	85.4	10.8	88.70	2,282.1	-2,408.4	1,367.5	1,272.7	94.80	14.426	
8,400.0	5,121.8	5,075.6	5,075.2	88.0	10.8	88.68	2,282.1	-2,408.4	1,340.4	1,242.2	98.12	13.660	
8,500.0	5,121.6	5,075.1	5,074.7	90.5	10.8	88.66	2,282.1	-2,408.4	1,320.2	1,219.1	101.14	13.054	
8,600.0	5,121.4	5,074.6	5,074.2	93.1	10.8	88.63	2,282.1	-2,408.4	1,307.5	1,203.7	103.76	12.600	
8,700.0	5,121.2	5,074.1	5,073.7	95.6	10.8	88.61	2,282.1	-2,408.4	1,302.3	1,196.3	105.92	12.295	
8,717.8	5,121.2	5,074.0	5,073.6	96.1	10.8	88.61	2,282.1	-2,408.4	1,302.1	1,195.9	106.25	12.256 CC, ES	
8,800.0	5,121.1	5,073.6	5,073.2	98.2	10.8	88.59	2,282.0	-2,408.4	1,304.7	1,197.2	107.55	12.131	
8,900.0	5,120.9	5,073.2	5,072.7	100.8	10.8	88.57	2,282.0	-2,408.4	1,314.8	1,206.2	108.65	12.102 SF	
9,000.0	5,120.7	5,072.7	5,072.2	103.4	10.8	88.55	2,282.0	-2,408.4	1,332.4	1,223.2	109.20	12.201	
9,100.0	5,120.5	5,072.2	5,071.8	105.9	10.8	88.53	2,282.0	-2,408.5	1,357.1	1,247.8	109.24	12.422	
9,200.0	5,120.4	5,071.7	5,071.3	108.5	10.8	88.51	2,282.0	-2,408.5	1,388.5	1,279.7	108.83	12.758	
9,300.0	5,120.2	5,071.2	5,070.8	111.1	10.8	88.49	2,282.0	-2,408.5	1,426.4	1,318.3	108.03	13.203	
9,400.0	5,120.0	5,070.7	5,070.3	113.7	10.8	88.46	2,282.0	-2,408.5	1,470.0	1,363.1	106.91	13.749	

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Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S34-T23N-R7W
 Site Error: 0.0ft
 Reference Well: NORTH ALAMITO UNIT 306H
 Well Error: 0.0ft
 Reference Wellbore: OH
 Reference Design: PLAN #2

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 306H
 TVD Reference: 16' KB @ 6911.0ft
 MD Reference: 16' KB @ 6911.0ft
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design S34-T23N-R7W - Federal I-2 (Existing) - INC ONLY - SURVEYS													Offset Site Error: 0.0 ft
Survey Program: 751-ISCWSA MWD													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
5,350.0	5,031.3	5,020.4	5,019.9	25.1	10.5	42.97	337.6	-1,614.5	1,498.3	1,463.0	35.31	42.428	
5,400.0	5,054.2	5,043.6	5,043.1	25.2	10.6	45.66	337.2	-1,614.9	1,457.6	1,422.0	35.59	40.958	
5,450.0	5,074.1	5,063.8	5,063.3	25.3	10.6	49.19	336.9	-1,615.3	1,415.4	1,379.5	35.86	39.467	
5,500.0	5,090.9	5,080.9	5,080.4	25.5	10.7	53.72	336.6	-1,615.6	1,371.8	1,335.7	36.14	37.959	
5,550.0	5,104.5	5,094.8	5,094.3	25.7	10.7	59.44	336.4	-1,615.9	1,327.1	1,290.7	36.42	36.440	
5,600.0	5,114.9	5,105.5	5,104.9	26.0	10.7	66.48	336.3	-1,616.1	1,281.6	1,244.9	36.70	34.917	
5,650.0	5,122.0	5,112.8	5,112.2	26.4	10.7	74.89	336.1	-1,616.2	1,235.4	1,198.4	37.00	33.394	
5,700.0	5,125.7	5,116.8	5,116.2	26.8	10.8	84.49	336.1	-1,616.3	1,188.8	1,151.5	37.29	31.878	
5,732.8	5,126.4	5,117.5	5,117.0	27.2	10.8	91.20	336.1	-1,616.3	1,158.1	1,120.6	37.49	30.889	
5,800.0	5,126.3	5,117.6	5,117.1	28.0	10.8	91.21	336.1	-1,616.3	1,095.4	1,057.5	37.93	28.879	
5,900.0	5,126.1	5,117.8	5,117.2	29.5	10.8	91.23	336.1	-1,616.3	1,003.1	964.4	38.72	25.908	
6,000.0	5,125.9	5,117.9	5,117.4	31.2	10.8	91.25	336.0	-1,616.3	912.5	872.8	39.71	22.978	
6,100.0	5,125.8	5,118.1	5,117.5	33.0	10.8	91.27	336.0	-1,616.4	824.1	783.1	40.98	20.111	
6,200.0	5,125.6	5,118.2	5,117.7	35.0	10.8	91.29	336.0	-1,616.4	738.7	696.1	42.59	17.342	
6,300.0	5,125.4	5,118.4	5,117.8	37.1	10.8	91.32	336.0	-1,616.4	657.3	612.6	44.65	14.722	
6,400.0	5,125.2	5,118.5	5,118.0	39.2	10.8	91.34	336.0	-1,616.4	581.8	534.6	47.22	12.320	
6,500.0	5,125.1	5,118.7	5,118.1	41.4	10.8	91.36	336.0	-1,616.4	514.7	464.4	50.32	10.228	
6,600.0	5,124.9	5,118.8	5,118.3	43.7	10.8	91.38	336.0	-1,616.4	459.7	406.0	53.70	8.560	
6,700.0	5,124.7	5,119.0	5,118.4	45.9	10.8	91.40	336.0	-1,616.4	421.6	364.9	56.73	7.432	
6,800.0	5,124.5	5,119.1	5,118.6	48.3	10.8	91.42	336.0	-1,616.4	405.2	346.8	58.38	6.942	
6,817.8	5,124.5	5,119.2	5,118.6	48.7	10.8	91.43	336.0	-1,616.4	404.8	346.4	58.46	6.925 CC, ES, SF	
6,900.0	5,124.4	5,119.3	5,118.7	50.6	10.8	91.44	336.0	-1,616.4	413.1	355.1	57.94	7.130	
7,000.0	5,124.2	5,119.4	5,118.9	53.0	10.8	91.46	336.0	-1,616.4	443.9	388.2	55.70	7.969	
7,100.0	5,124.0	5,119.6	5,119.0	55.4	10.8	91.49	336.0	-1,616.4	493.5	440.8	52.65	9.373	
7,200.0	5,123.8	5,119.7	5,119.2	57.9	10.8	91.51	336.0	-1,616.4	556.7	507.1	49.59	11.227	
7,300.0	5,123.7	5,119.9	5,119.3	60.3	10.8	91.53	336.0	-1,616.4	629.6	582.7	46.92	13.419	
7,400.0	5,123.5	5,120.0	5,119.5	62.8	10.8	91.55	336.0	-1,616.4	709.1	664.4	44.73	15.854	
7,500.0	5,123.3	5,120.2	5,119.6	65.2	10.8	91.57	336.0	-1,616.4	793.2	750.3	42.97	18.459	
7,600.0	5,123.2	5,120.3	5,119.8	67.7	10.8	91.59	336.0	-1,616.4	880.7	839.1	41.58	21.179	
7,700.0	5,123.0	5,120.5	5,119.9	70.2	10.8	91.61	336.0	-1,616.4	970.6	930.1	40.48	23.978	
7,800.0	5,122.8	5,120.6	5,120.1	72.7	10.8	91.64	336.0	-1,616.4	1,062.3	1,022.7	39.60	26.828	
7,900.0	5,122.6	5,120.8	5,120.2	75.3	10.8	91.66	336.0	-1,616.4	1,155.4	1,116.5	38.89	29.711	
8,000.0	5,122.5	5,120.9	5,120.4	77.8	10.8	91.68	336.0	-1,616.4	1,249.6	1,211.2	38.31	32.616	
8,100.0	5,122.3	5,121.1	5,120.5	80.3	10.8	91.70	336.0	-1,616.4	1,344.6	1,306.7	37.84	35.532	
8,200.0	5,122.1	5,121.2	5,120.7	82.9	10.8	91.72	336.0	-1,616.4	1,440.2	1,402.8	37.45	38.454	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

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 Reference Design: PLAN #2

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 306H
 TVD Reference: 16' KB @ 6911.0ft
 MD Reference: 16' KB @ 6911.0ft
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

S34-T23N-R7W - Federal I-4 (Existing) - EXISTING - SURVEYS													Offset Site Error: 0.0 ft
Survey Program: 100-ISCWSA MWD													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis			Distance		Total		Separation		Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Uncertainty Axis	Factor	
9,100.0	5,120.5	5,082.2	5,081.1	105.9	10.7	-87.80	2,112.2	-4,956.7	1,484.1	1,436.4	47.69	31.121	
9,200.0	5,120.4	5,082.7	5,081.6	108.5	10.7	-87.85	2,112.2	-4,956.7	1,391.7	1,341.1	50.57	27.519	
9,300.0	5,120.2	5,083.3	5,082.2	111.1	10.7	-87.91	2,112.2	-4,956.7	1,300.3	1,246.4	53.98	24.089	
9,400.0	5,120.0	5,083.8	5,082.7	113.7	10.7	-87.97	2,112.2	-4,956.7	1,210.4	1,152.4	58.01	20.864	
9,500.0	5,119.8	5,084.3	5,083.2	116.3	10.7	-88.02	2,112.1	-4,956.7	1,122.1	1,059.4	62.78	17.875	
9,600.0	5,119.7	5,084.9	5,083.7	118.9	10.7	-88.08	2,112.1	-4,956.7	1,036.0	967.6	68.40	15.146	
9,700.0	5,119.5	5,085.4	5,084.3	121.5	10.7	-88.13	2,112.1	-4,956.8	952.6	877.6	75.03	12.696	
9,800.0	5,119.3	5,085.9	5,084.8	124.1	10.7	-88.19	2,112.1	-4,956.8	872.7	789.9	82.82	10.537	
9,900.0	5,119.1	5,086.4	5,085.3	126.7	10.7	-88.24	2,112.1	-4,956.8	797.3	705.4	91.89	8.677	
10,000.0	5,119.0	5,087.0	5,085.9	129.3	10.7	-88.30	2,112.1	-4,956.8	727.9	625.6	102.28	7.117	
10,100.0	5,118.8	5,087.5	5,086.4	131.9	10.7	-88.35	2,112.1	-4,956.8	666.3	552.5	113.81	5.855	
10,200.0	5,118.6	5,088.0	5,086.9	134.5	10.7	-88.41	2,112.1	-4,956.8	614.9	489.0	125.94	4.883	
10,300.0	5,118.4	5,088.6	5,087.4	137.1	10.7	-88.46	2,112.1	-4,956.8	576.4	438.9	137.55	4.191	
10,400.0	5,118.3	5,089.1	5,088.0	139.7	10.7	-88.52	2,112.1	-4,956.8	553.6	406.5	147.05	3.765	
10,479.3	5,118.1	5,089.5	5,088.4	141.7	10.7	-88.56	2,112.1	-4,956.8	547.9	395.9	151.99	3.605 CC	
10,500.0	5,118.1	5,089.6	5,088.5	142.3	10.7	-88.57	2,112.1	-4,956.8	548.2	395.4	152.82	3.588 ES, SF	
10,600.0	5,117.9	5,090.1	5,089.0	144.9	10.7	-88.63	2,112.1	-4,956.9	561.0	406.9	154.08	3.641	
10,700.0	5,117.7	5,090.7	5,089.6	147.5	10.7	-88.68	2,112.1	-4,956.9	590.6	439.4	151.27	3.904	
10,800.0	5,117.6	5,091.2	5,090.1	150.1	10.7	-88.74	2,112.0	-4,956.9	634.8	489.1	145.68	4.358	
10,900.0	5,117.4	5,091.7	5,090.6	152.7	10.7	-88.79	2,112.0	-4,956.9	690.7	552.0	138.68	4.981	
11,000.0	5,117.2	5,092.2	5,091.1	155.3	10.7	-88.85	2,112.0	-4,956.9	755.8	624.5	131.34	5.755	
11,100.0	5,117.0	5,092.8	5,091.7	157.9	10.7	-88.90	2,112.0	-4,956.9	827.9	703.6	124.25	6.663	
11,200.0	5,116.9	5,093.3	5,092.2	160.6	10.7	-88.96	2,112.0	-4,956.9	905.3	787.6	117.72	7.690	
11,300.0	5,116.7	5,093.8	5,092.7	163.2	10.7	-89.01	2,112.0	-4,956.9	986.7	874.9	111.84	8.823	
11,400.0	5,116.5	5,094.4	5,093.2	165.8	10.7	-89.07	2,112.0	-4,957.0	1,071.3	964.7	106.62	10.049	
11,500.0	5,116.3	5,094.9	5,093.8	168.4	10.7	-89.12	2,112.0	-4,957.0	1,158.4	1,056.4	102.00	11.357	
11,567.1	5,116.2	5,095.2	5,094.1	170.2	10.7	-89.16	2,112.0	-4,957.0	1,217.9	1,118.7	99.20	12.277	

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NORTH ALAMITO UNIT 306H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 6911.0ft
Reference Site:	S34-T23N-R7W	MD Reference:	16' KB @ 6911.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	NORTH ALAMITO UNIT 306H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2	Offset TVD Reference:	Offset Datum

Offset Design S34-T23N-R7W - NORTH ALAMITO UNIT 307H - OH - PLAN #1														Offset Site Error:	0.0 ft
Survey Program: 0-MWD+HDMG														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
0.0	0.0	0.0	0.0	0.0	0.0	12.96	29.5	6.8	30.3						
100.0	100.0	100.0	100.0	0.2	0.2	12.96	29.5	6.8	30.3	30.0	0.30	100.481			
200.0	200.0	200.0	200.0	0.5	0.5	12.96	29.5	6.8	30.3	29.2	1.02	29.723			
300.0	300.0	300.0	300.0	0.9	0.9	12.96	29.5	6.8	30.3	28.5	1.74	17.441			
400.0	400.0	400.0	400.0	1.2	1.2	12.96	29.5	6.8	30.3	27.8	2.45	12.342			
500.0	500.0	500.0	500.0	1.6	1.6	12.96	29.5	6.8	30.3	27.1	3.17	9.549 CC, ES			
600.0	600.0	600.0	600.0	1.9	1.9	171.29	29.5	6.8	32.0	28.1	3.87	8.264			
700.0	699.8	700.3	700.3	2.3	2.3	175.06	28.4	8.2	36.5	32.0	4.56	8.021			
800.0	799.5	800.3	800.1	2.6	2.6	-177.47	25.3	12.4	43.8	38.6	5.24	8.365			
900.0	898.7	899.7	899.1	3.0	3.0	-169.06	20.1	19.3	54.7	48.8	5.93	9.225			
1,000.0	997.5	998.2	996.9	3.3	3.3	-161.50	12.9	28.8	69.9	63.2	6.65	10.512			
1,100.0	1,095.6	1,096.1	1,094.0	3.7	3.7	-156.69	5.1	39.3	89.1	81.7	7.38	12.074			
1,200.0	1,193.1	1,193.4	1,190.4	4.2	4.1	-154.30	-2.7	49.7	111.7	103.6	8.12	13.761			
1,300.0	1,289.6	1,290.0	1,286.2	4.6	4.4	-153.28	-10.5	60.0	137.5	128.6	8.87	15.502			
1,385.1	1,371.1	1,371.6	1,367.0	5.0	4.7	-153.05	-17.0	68.6	161.8	152.3	9.51	17.003			
1,400.0	1,385.3	1,385.8	1,381.1	5.1	4.8	-153.09	-18.1	70.2	166.2	156.6	9.63	17.260			
1,500.0	1,480.5	1,481.3	1,475.7	5.6	5.2	-153.29	-25.8	80.3	196.1	185.7	10.39	18.871			
1,600.0	1,575.8	1,576.7	1,570.3	6.1	5.5	-153.43	-33.4	90.5	225.9	214.7	11.16	20.247			
1,700.0	1,671.1	1,672.2	1,664.9	6.6	5.9	-153.54	-41.1	100.7	255.7	243.8	11.93	21.433			
1,800.0	1,766.3	1,767.6	1,759.5	7.1	6.3	-153.63	-48.7	110.9	285.5	272.8	12.71	22.464			
1,900.0	1,861.6	1,863.1	1,854.1	7.7	6.7	-153.70	-56.4	121.0	315.4	301.9	13.50	23.368			
2,000.0	1,956.9	1,958.5	1,948.7	8.2	7.1	-153.76	-64.0	131.2	345.2	330.9	14.28	24.165			
2,100.0	2,052.1	2,054.0	2,043.3	8.7	7.4	-153.81	-71.6	141.4	375.0	359.9	15.08	24.873			
2,200.0	2,147.4	2,149.4	2,137.8	9.3	7.8	-153.86	-79.3	151.5	404.9	389.0	15.87	25.506			
2,300.0	2,242.7	2,244.8	2,232.4	9.8	8.2	-153.89	-86.9	161.7	434.7	418.0	16.67	26.074			
2,400.0	2,337.9	2,340.3	2,327.0	10.4	8.6	-153.93	-94.6	171.9	464.5	447.0	17.47	26.588			
2,500.0	2,433.2	2,435.7	2,421.6	10.9	9.0	-153.95	-102.2	182.1	494.3	476.1	18.27	27.054			
2,600.0	2,528.5	2,531.2	2,516.2	11.5	9.4	-153.98	-109.9	192.2	524.2	505.1	19.08	27.478			
2,700.0	2,623.7	2,626.6	2,610.8	12.0	9.7	-154.00	-117.5	202.4	554.0	534.1	19.88	27.866			
2,800.0	2,719.0	2,722.1	2,705.4	12.6	10.1	-154.02	-125.2	212.6	583.8	563.1	20.69	28.222			
2,900.0	2,814.3	2,817.5	2,800.0	13.2	10.5	-154.04	-132.8	222.8	613.7	592.2	21.49	28.550			
3,000.0	2,909.5	2,913.0	2,894.6	13.7	10.9	-154.05	-140.5	232.9	643.5	621.2	22.30	28.853			
3,100.0	3,004.8	3,008.4	2,989.2	14.3	11.3	-154.07	-148.1	243.1	673.3	650.2	23.11	29.134			
3,200.0	3,100.1	3,103.9	3,083.8	14.8	11.7	-154.08	-155.7	253.3	703.1	679.2	23.92	29.395			
3,300.0	3,195.3	3,199.3	3,178.4	15.4	12.1	-154.10	-163.4	263.5	733.0	708.2	24.73	29.638			
3,400.0	3,290.6	3,294.8	3,273.0	15.9	12.4	-154.11	-171.0	273.6	762.8	737.3	25.54	29.865			
3,500.0	3,385.9	3,390.2	3,367.6	16.5	12.8	-154.12	-178.7	283.8	792.6	766.3	26.35	30.077			
3,600.0	3,481.1	3,485.7	3,462.2	17.1	13.2	-154.13	-186.3	294.0	822.5	795.3	27.17	30.276			
3,700.0	3,576.4	3,581.1	3,556.8	17.6	13.6	-154.14	-194.0	304.1	852.3	824.3	27.98	30.462			
3,800.0	3,671.6	3,676.6	3,651.4	18.2	14.0	-154.15	-201.6	314.3	882.1	853.3	28.79	30.638			
3,900.0	3,766.9	3,772.0	3,746.0	18.7	14.4	-154.15	-209.3	324.5	912.0	882.3	29.61	30.804			
4,000.0	3,862.2	3,867.4	3,840.6	19.3	14.8	-154.16	-216.9	334.7	941.8	911.4	30.42	30.960			
4,100.0	3,957.4	3,962.9	3,935.2	19.9	15.2	-154.17	-224.5	344.8	971.6	940.4	31.23	31.108			
4,200.0	4,052.7	4,058.3	4,029.7	20.4	15.5	-154.18	-232.2	355.0	1,001.4	969.4	32.05	31.249			
4,300.0	4,148.0	4,153.8	4,124.3	21.0	15.9	-154.18	-239.8	365.2	1,031.3	998.4	32.86	31.382			
4,400.0	4,243.2	4,249.2	4,218.9	21.6	16.3	-154.19	-247.5	375.4	1,061.1	1,027.4	33.68	31.508			
4,500.0	4,338.5	4,344.7	4,313.5	22.1	16.7	-154.19	-255.1	385.5	1,090.9	1,056.4	34.49	31.628			
4,530.6	4,367.6	4,374.4	4,343.0	22.3	16.8	-154.20	-257.5	388.7	1,100.0	1,065.3	34.75	31.659			
4,550.0	4,386.2	4,395.6	4,364.1	22.4	16.9	-159.41	-258.9	390.6	1,105.8	1,070.9	34.92	31.666			
4,600.0	4,434.0	4,450.1	4,418.4	22.7	17.1	-173.70	-260.6	393.5	1,120.8	1,085.4	35.34	31.710			
4,650.0	4,481.9	4,504.7	4,473.0	22.9	17.3	171.81	-259.4	393.2	1,135.7	1,100.0	35.71	31.799			
4,700.0	4,529.6	4,559.3	4,527.3	23.2	17.4	158.48	-255.5	389.9	1,150.5	1,114.4	36.04	31.921			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Reference Site: S34-T23N-R7W
 Site Error: 0.0ft
 Reference Well: NORTH ALAMITO UNIT 306H
 Well Error: 0.0ft
 Reference Wellbore: OH
 Reference Design: PLAN #2

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 306H
 TVD Reference: 16' KB @ 6911.0ft
 MD Reference: 16' KB @ 6911.0ft
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA EDM 5000 Multi Users DB
 Offset TVD Reference: Offset Datum

Offset Design S34-T23N-R7W - NORTH ALAMITO UNIT 307H - OH - PLAN #1													Offset Site Error: 0.0 ft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)					
4,750.0	4,576.8	4,614.0	4,581.3	23.4	17.6	147.08	-248.8	383.5	1,165.1	1,128.8	36.33	32.066	
4,800.0	4,623.4	4,668.8	4,634.4	23.6	17.7	137.71	-239.4	374.0	1,179.5	1,142.9	36.60	32.228	
4,850.0	4,669.1	4,723.7	4,686.5	23.8	17.8	130.10	-227.2	361.5	1,193.6	1,156.7	36.84	32.399	
4,900.0	4,713.6	4,778.8	4,737.1	24.0	17.9	123.89	-212.4	346.1	1,207.3	1,170.2	37.06	32.572	
4,950.0	4,756.9	4,833.9	4,786.1	24.1	18.1	118.77	-195.0	327.8	1,220.5	1,183.2	37.28	32.737	
5,000.0	4,798.5	4,889.1	4,833.0	24.3	18.2	114.47	-175.1	306.7	1,233.2	1,195.7	37.50	32.882	
5,050.0	4,838.5	4,944.4	4,877.7	24.4	18.3	110.82	-152.8	282.9	1,245.4	1,207.6	37.75	32.992	
5,100.0	4,876.5	4,999.7	4,919.7	24.5	18.5	107.70	-128.3	256.6	1,256.9	1,218.8	38.03	33.051	
5,150.0	4,912.4	5,055.0	4,958.9	24.6	18.7	104.98	-101.7	227.9	1,267.7	1,229.3	38.37	33.038	
5,200.0	4,946.0	5,110.4	4,994.9	24.8	19.0	102.62	-73.2	197.0	1,277.7	1,238.9	38.79	32.940	
5,250.0	4,977.1	5,165.7	5,027.5	24.9	19.3	100.55	-42.9	164.2	1,287.0	1,247.7	39.31	32.740	
5,300.0	5,005.6	5,220.9	5,056.5	25.0	19.7	98.73	-11.1	129.7	1,295.4	1,255.4	39.94	32.431	
5,350.0	5,031.3	5,275.9	5,081.8	25.1	20.2	97.14	21.9	93.6	1,302.9	1,262.2	40.71	32.006	
5,400.0	5,054.2	5,330.8	5,103.2	25.2	20.7	95.75	56.0	56.4	1,309.5	1,267.9	41.61	31.470	
5,450.0	5,074.1	5,385.4	5,120.5	25.3	21.3	94.54	90.9	18.2	1,315.2	1,272.5	42.66	30.832	
5,500.0	5,090.9	5,439.7	5,133.9	25.5	22.0	93.51	126.3	-20.7	1,319.8	1,276.0	43.84	30.107	
5,550.0	5,104.5	5,493.6	5,143.1	25.7	22.8	92.63	162.1	-60.1	1,323.5	1,278.4	45.15	29.314	
5,600.0	5,114.9	5,547.2	5,148.3	26.0	23.6	91.91	197.9	-99.5	1,326.2	1,279.6	46.57	28.477	
5,650.0	5,122.0	5,599.7	5,149.6	26.4	24.4	91.35	233.1	-138.4	1,327.9	1,279.8	48.08	27.620	
5,700.0	5,125.7	5,649.5	5,149.5	26.8	25.2	91.04	266.6	-175.4	1,328.6	1,279.0	49.64	26.764	
5,732.8	5,126.4	5,682.4	5,149.4	27.2	25.8	90.99	288.6	-199.7	1,328.6	1,277.9	50.70	26.203	
5,800.0	5,126.3	5,749.5	5,149.3	28.0	27.0	90.99	333.7	-249.5	1,328.1	1,275.1	53.00	25.057	
5,900.0	5,126.1	5,849.5	5,149.1	29.5	28.9	90.99	400.8	-323.6	1,327.3	1,270.7	56.66	23.427	
6,000.0	5,125.9	5,949.5	5,149.0	31.2	30.9	90.99	467.9	-397.7	1,326.6	1,266.0	60.56	21.907	
6,100.0	5,125.8	6,049.5	5,148.8	33.0	33.0	91.00	535.1	-471.9	1,325.9	1,261.2	64.65	20.508	
6,200.0	5,125.6	6,149.5	5,148.6	35.0	35.2	91.00	602.2	-546.0	1,325.1	1,256.2	68.91	19.229	
6,300.0	5,125.4	6,249.5	5,148.4	37.1	37.5	91.00	669.3	-620.1	1,324.4	1,251.1	73.31	18.067	
6,400.0	5,125.2	6,349.5	5,148.3	39.2	39.8	91.00	736.4	-694.2	1,323.7	1,245.9	77.81	17.011	
6,500.0	5,125.1	6,449.5	5,148.1	41.4	42.1	91.00	803.5	-768.4	1,322.9	1,240.5	82.41	16.052	
6,600.0	5,124.9	6,549.5	5,147.9	43.7	44.5	91.00	870.6	-842.5	1,322.2	1,235.1	87.09	15.182	
6,700.0	5,124.7	6,649.5	5,147.7	45.9	46.9	91.00	937.8	-916.6	1,321.5	1,229.6	91.84	14.389	
6,800.0	5,124.5	6,749.5	5,147.6	48.3	49.3	91.00	1,004.9	-990.7	1,320.7	1,224.1	96.64	13.667	
6,900.0	5,124.4	6,849.5	5,147.4	50.6	51.7	91.00	1,072.0	-1,064.9	1,320.0	1,218.5	101.49	13.006	
7,000.0	5,124.2	6,949.5	5,147.2	53.0	54.2	91.00	1,139.1	-1,139.0	1,319.3	1,212.9	106.39	12.401	
7,100.0	5,124.0	7,049.5	5,147.0	55.4	56.7	91.00	1,206.2	-1,213.1	1,318.5	1,207.2	111.32	11.845	
7,200.0	5,123.8	7,149.5	5,146.9	57.9	59.2	91.00	1,273.3	-1,287.2	1,317.8	1,201.5	116.28	11.333	
7,300.0	5,123.7	7,249.5	5,146.7	60.3	61.7	91.00	1,340.5	-1,361.4	1,317.1	1,195.8	121.27	10.861	
7,400.0	5,123.5	7,349.5	5,146.5	62.8	64.2	91.00	1,407.6	-1,435.5	1,316.3	1,190.1	126.28	10.424	
7,500.0	5,123.3	7,449.5	5,146.3	65.2	66.8	91.00	1,474.7	-1,509.6	1,315.6	1,184.3	131.32	10.019	
7,600.0	5,123.2	7,549.5	5,146.2	67.7	69.3	91.00	1,541.8	-1,583.8	1,314.9	1,178.5	136.37	9.642	
7,700.0	5,123.0	7,649.5	5,146.0	70.2	71.8	91.00	1,608.9	-1,657.9	1,314.2	1,172.7	141.44	9.291	
7,800.0	5,122.8	7,749.5	5,145.8	72.7	74.4	91.00	1,676.0	-1,732.0	1,313.4	1,166.9	146.53	8.963	
7,900.0	5,122.6	7,849.5	5,145.7	75.3	77.0	91.01	1,743.2	-1,806.1	1,312.7	1,161.1	151.63	8.657	
8,000.0	5,122.5	7,949.5	5,145.5	77.8	79.5	91.01	1,810.3	-1,880.3	1,312.0	1,155.2	156.75	8.370	
8,100.0	5,122.3	8,049.5	5,145.3	80.3	82.1	91.01	1,877.4	-1,954.4	1,311.2	1,149.3	161.88	8.100	
8,200.0	5,122.1	8,149.5	5,145.1	82.9	84.7	91.01	1,944.5	-2,028.5	1,310.5	1,143.5	167.01	7.847	
8,300.0	5,121.9	8,249.5	5,145.0	85.4	87.3	91.01	2,011.6	-2,102.6	1,309.8	1,137.6	172.16	7.608	
8,400.0	5,121.8	8,349.5	5,144.8	88.0	89.9	91.01	2,078.7	-2,176.8	1,309.0	1,131.7	177.31	7.383	
8,500.0	5,121.6	8,449.5	5,144.6	90.5	92.5	91.01	2,145.9	-2,250.9	1,308.3	1,125.8	182.47	7.170	
8,600.0	5,121.4	8,549.5	5,144.4	93.1	95.0	91.01	2,213.0	-2,325.0	1,307.6	1,119.9	187.64	6.968	
8,700.0	5,121.2	8,649.4	5,144.3	95.6	97.6	91.01	2,280.1	-2,399.1	1,306.8	1,114.0	192.82	6.777	
8,800.0	5,121.1	8,749.4	5,144.1	98.2	100.2	91.01	2,347.2	-2,473.3	1,306.1	1,108.1	198.00	6.596	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well NORTH ALAMITO UNIT 306H
Project:	Sandoval County, NM	TVD Reference:	16' KB @ 6911.0ft
Reference Site:	S34-T23N-R7W	MD Reference:	16' KB @ 6911.0ft
Site Error:	0.0ft	North Reference:	True
Reference Well:	NORTH ALAMITO UNIT 306H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	USA EDM 5000 Multi Users DB
Reference Design:	PLAN #2	Offset TVD Reference:	Offset Datum

Offset Design S34-T23N-R7W - NORTH ALAMITO UNIT 307H - OH - PLAN #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
8,900.0	5,120.9	8,849.4	5,143.9	100.8	102.8	91.01	2,414.3	-2,547.4	1,305.4	1,102.2	203.19	6.424		
9,000.0	5,120.7	8,949.4	5,143.7	103.4	105.5	91.01	2,481.4	-2,621.5	1,304.6	1,096.2	208.38	6.261		
9,100.0	5,120.5	9,049.4	5,143.6	105.9	108.1	91.01	2,548.6	-2,695.7	1,303.9	1,090.3	213.58	6.105		
9,200.0	5,120.4	9,149.4	5,143.4	108.5	110.7	91.01	2,615.7	-2,769.8	1,303.2	1,084.4	218.78	5.956		
9,300.0	5,120.2	9,249.4	5,143.2	111.1	113.3	91.01	2,682.8	-2,843.9	1,302.4	1,078.4	223.99	5.815		
9,400.0	5,120.0	9,349.4	5,143.0	113.7	115.9	91.01	2,749.9	-2,918.0	1,301.7	1,072.5	229.20	5.679		
9,500.0	5,119.8	9,449.4	5,142.9	116.3	118.5	91.01	2,817.0	-2,992.2	1,301.0	1,066.6	234.41	5.550		
9,600.0	5,119.7	9,549.4	5,142.7	118.9	121.1	91.01	2,884.2	-3,066.3	1,300.2	1,060.6	239.63	5.426		
9,700.0	5,119.5	9,649.4	5,142.5	121.5	123.7	91.02	2,951.3	-3,140.4	1,299.5	1,054.6	244.85	5.307		
9,800.0	5,119.3	9,749.4	5,142.3	124.1	126.4	91.02	3,018.4	-3,214.5	1,298.8	1,048.7	250.08	5.193		
9,900.0	5,119.1	9,849.4	5,142.2	126.7	129.0	91.02	3,085.5	-3,288.7	1,298.0	1,042.7	255.30	5.084		
10,000.0	5,119.0	9,949.4	5,142.0	129.3	131.6	91.02	3,152.6	-3,362.8	1,297.3	1,036.8	260.53	4.979		
10,100.0	5,118.8	10,049.4	5,141.8	131.9	134.2	91.02	3,219.7	-3,436.9	1,296.6	1,030.8	265.76	4.879		
10,200.0	5,118.6	10,149.4	5,141.6	134.5	136.9	91.02	3,286.9	-3,511.0	1,295.8	1,024.8	271.00	4.782		
10,300.0	5,118.4	10,249.4	5,141.5	137.1	139.5	91.02	3,354.0	-3,585.2	1,295.1	1,018.9	276.23	4.688		
10,400.0	5,118.3	10,349.4	5,141.3	139.7	142.1	91.02	3,421.1	-3,659.3	1,294.4	1,012.9	281.47	4.599		
10,500.0	5,118.1	10,449.4	5,141.1	142.3	144.7	91.02	3,488.2	-3,733.4	1,293.6	1,006.9	286.71	4.512		
10,600.0	5,117.9	10,549.4	5,140.9	144.9	147.4	91.02	3,555.3	-3,807.5	1,292.9	1,001.0	291.95	4.428		
10,700.0	5,117.7	10,649.4	5,140.8	147.5	150.0	91.02	3,622.4	-3,881.7	1,292.2	995.0	297.20	4.348		
10,800.0	5,117.6	10,749.4	5,140.6	150.1	152.6	91.02	3,689.6	-3,955.8	1,291.4	989.0	302.44	4.270		
10,900.0	5,117.4	10,849.4	5,140.4	152.7	155.3	91.02	3,756.7	-4,029.9	1,290.7	983.0	307.69	4.195		
11,000.0	5,117.2	10,949.4	5,140.2	155.3	157.9	91.02	3,823.8	-4,104.1	1,290.0	977.0	312.94	4.122		
11,100.0	5,117.0	11,049.4	5,140.1	157.9	160.5	91.02	3,890.9	-4,178.2	1,289.2	971.1	318.19	4.052		
11,200.0	5,116.9	11,149.4	5,139.9	160.6	163.1	91.02	3,958.0	-4,252.3	1,288.5	965.1	323.44	3.984		
11,300.0	5,116.7	11,249.4	5,139.7	163.2	165.8	91.02	4,025.1	-4,326.4	1,287.8	959.1	328.69	3.918		
11,400.0	5,116.5	11,349.4	5,139.5	165.8	168.4	91.03	4,092.3	-4,400.6	1,287.1	953.1	333.95	3.854		
11,500.0	5,116.3	11,449.4	5,139.4	168.4	171.0	91.03	4,159.4	-4,474.7	1,286.3	947.1	339.20	3.792		
11,567.1	5,116.2	11,516.5	5,139.3	170.2	172.8	91.03	4,204.4	-4,524.4	1,285.8	943.1	342.73	3.752 SF		

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 306H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #2

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 306H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design S34-T23N-R7W - NORTH ALAMITO UNIT 308H - OH - PLAN #1														Offset Site Error: 0.0 ft	
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor			
0.0	0.0	0.0	0.0	0.0	0.0	13.67	58.3	14.2	60.0						
100.0	100.0	100.0	100.0	0.2	0.2	13.67	58.3	14.2	60.0	59.6	0.30	199.061			
200.0	200.0	200.0	200.0	0.5	0.5	13.67	58.3	14.2	60.0	58.9	1.02	58.884			
300.0	300.0	300.0	300.0	0.9	0.9	13.67	58.3	14.2	60.0	58.2	1.74	34.552			
400.0	400.0	400.0	400.0	1.2	1.2	13.67	58.3	14.2	60.0	57.5	2.45	24.450			
500.0	500.0	500.0	500.0	1.6	1.6	13.67	58.3	14.2	60.0	56.8	3.17	18.918 CC, ES			
600.0	600.0	600.0	600.0	1.9	1.9	171.73	58.3	14.2	61.7	57.8	3.87	15.936			
700.0	699.8	698.3	698.3	2.3	2.3	173.42	59.0	15.7	68.0	63.4	4.57	14.887 SF			
800.0	799.5	795.7	795.5	2.6	2.6	176.74	61.3	20.1	80.3	75.0	5.29	15.176			
900.0	898.7	891.5	891.0	3.0	3.0	-179.53	65.0	27.3	98.7	92.7	6.03	16.380			
1,000.0	997.5	985.4	984.2	3.3	3.3	-176.14	70.1	37.2	123.4	116.7	6.77	18.236			
1,100.0	1,095.6	1,076.6	1,074.4	3.7	3.7	-173.32	76.3	49.3	154.3	146.8	7.50	20.565			
1,200.0	1,193.1	1,164.9	1,161.2	4.2	4.0	-171.05	83.6	63.5	191.2	183.0	8.22	23.248			
1,300.0	1,289.6	1,249.8	1,244.2	4.6	4.4	-169.24	91.8	79.4	233.7	224.8	8.92	26.195			
1,385.1	1,371.1	1,319.1	1,311.6	5.0	4.7	-167.96	99.3	94.0	274.2	264.7	9.50	28.867			
1,400.0	1,385.3	1,331.0	1,323.1	5.1	4.7	-167.79	100.7	96.7	281.7	272.1	9.60	29.331			
1,500.0	1,480.5	1,409.3	1,398.6	5.6	5.1	-166.74	110.2	115.2	332.9	322.7	10.24	32.503			
1,600.0	1,575.8	1,485.3	1,471.3	6.1	5.4	-165.80	120.3	134.9	386.3	375.4	10.87	35.544			
1,700.0	1,671.1	1,561.5	1,543.6	6.6	5.8	-164.94	131.3	156.3	441.6	430.1	11.48	38.461			
1,800.0	1,766.3	1,644.3	1,621.9	7.1	6.2	-164.17	143.5	180.0	497.5	485.4	12.12	41.052			
1,900.0	1,861.6	1,727.0	1,700.3	7.7	6.7	-163.55	155.7	203.7	553.5	540.7	12.77	43.355			
2,000.0	1,956.9	1,809.8	1,778.6	8.2	7.1	-163.04	167.9	227.4	609.4	596.0	13.42	45.405			
2,100.0	2,052.1	1,892.5	1,856.9	8.7	7.6	-162.62	180.0	251.1	665.4	651.4	14.09	47.235			
2,200.0	2,147.4	1,975.3	1,935.3	9.3	8.1	-162.27	192.2	274.8	721.5	706.7	14.76	48.876			
2,300.0	2,242.7	2,058.0	2,013.6	9.8	8.5	-161.97	204.4	298.5	777.5	762.1	15.44	50.353			
2,400.0	2,337.9	2,140.8	2,092.0	10.4	9.0	-161.70	216.6	322.3	833.6	817.5	16.13	51.688			
2,500.0	2,433.2	2,223.5	2,170.3	10.9	9.5	-161.47	228.8	346.0	889.7	872.9	16.82	52.899			
2,600.0	2,528.5	2,306.3	2,248.6	11.5	10.0	-161.27	241.0	369.7	945.8	928.2	17.51	54.001			
2,700.0	2,623.7	2,389.0	2,327.0	12.0	10.5	-161.09	253.2	393.4	1,001.8	983.6	18.21	55.006			
2,800.0	2,719.0	2,471.8	2,405.3	12.6	10.9	-160.93	265.4	417.1	1,057.9	1,039.0	18.92	55.926			
2,900.0	2,814.3	2,554.5	2,483.6	13.2	11.4	-160.79	277.5	440.8	1,114.0	1,094.4	19.62	56.772			
3,000.0	2,909.5	2,637.3	2,562.0	13.7	11.9	-160.66	289.7	464.5	1,170.1	1,149.8	20.33	57.551			
3,100.0	3,004.8	2,720.0	2,640.3	14.3	12.4	-160.54	301.9	488.2	1,226.2	1,205.2	21.04	58.270			
3,200.0	3,100.1	2,802.8	2,718.7	14.8	12.9	-160.43	314.1	512.0	1,282.4	1,260.6	21.76	58.936			
3,300.0	3,195.3	2,885.5	2,797.0	15.4	13.4	-160.33	326.3	535.7	1,338.5	1,316.0	22.47	59.554			
3,400.0	3,290.6	2,968.3	2,875.3	15.9	13.9	-160.24	338.5	559.4	1,394.6	1,371.4	23.19	60.129			
3,500.0	3,385.9	3,051.0	2,953.7	16.5	14.4	-160.15	350.7	583.1	1,450.7	1,426.8	23.91	60.665			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: S34-T23N-R7W
Site Error: 0.0ft
Reference Well: NORTH ALAMITO UNIT 306H
Well Error: 0.0ft
Reference Wellbore: OH
Reference Design: PLAN #2

Local Co-ordinate Reference: Well NORTH ALAMITO UNIT 306H
TVD Reference: 16' KB @ 6911.0ft
MD Reference: 16' KB @ 6911.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to 16' KB @ 6911.0ft

Offset Depths are relative to Offset Datum

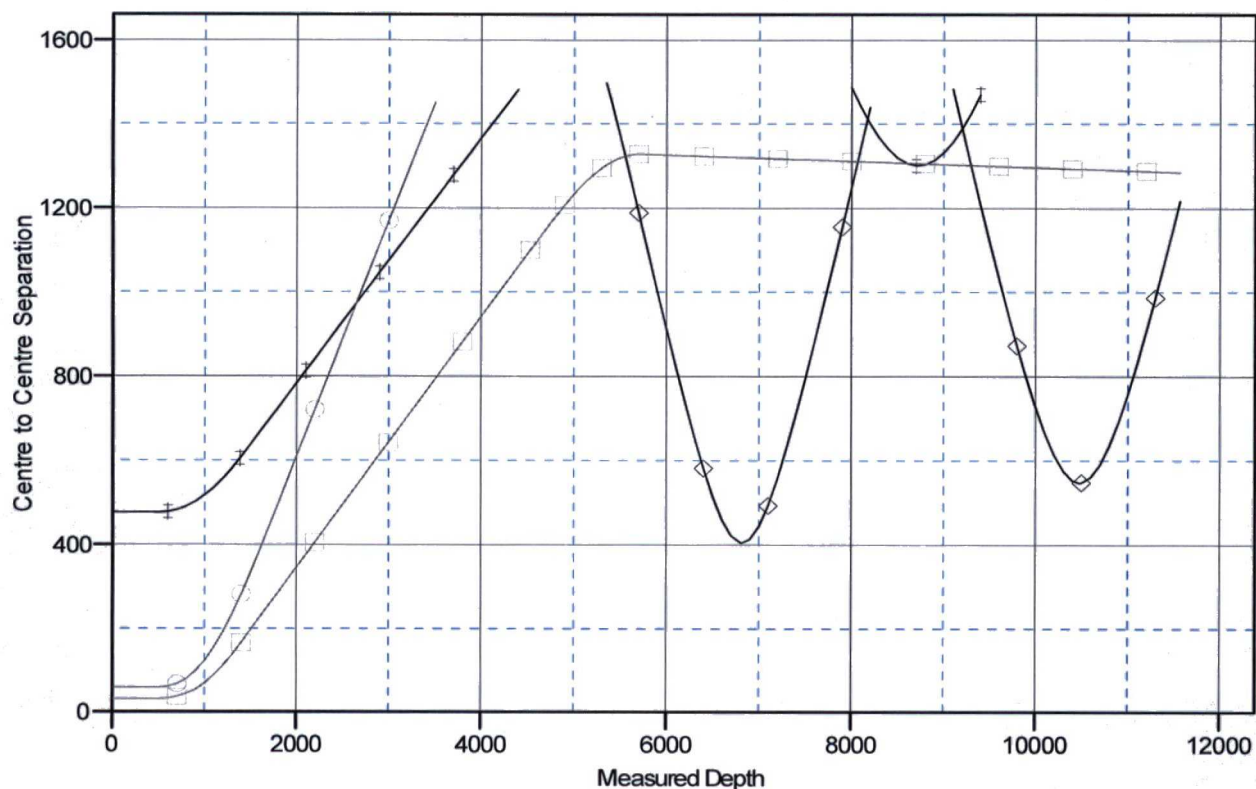
Central Meridian is -106.250000 °

Coordinates are relative to: NORTH ALAMITO UNIT 306H

Coordinate System is US State Plane 1983, New Mexico Central Zone

Grid Convergence at Surface is: -0.78°

Ladder Plot



LEGEND

Federal B-4 (Existing), IN ONLY, IN ONLY V0
 Federal I-1 (Existing), IN ONLY, SURVEYS V0
 Federal I-2 (Existing), IN ONLY, SURVEYS V0
 Federal I-4 (Existing), EXISTING, SURVEYS V0
 NORTH ALAMITO UNIT 307H, OH, PLAN#1 V
 NORTH ALAMITO UNIT 308H, OH, PLAN#1 V

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

North Alamito Unit 306H (FKA Lybrook L34-2307 01H)
 SHL: NWSW Sec 34, T27N, R7W, 1403' FSL, 762' FWL
 BHL: NWNW Sec 33, T23N, R7W, 720' FNL, 630' FWL
 Sandoval County, New Mexico

Encana Oil & Gas (USA) Inc. Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
Ojo Alamo	976
Kirtland Shale	1,161
Fruitland Coal	1,381
Pictured Cliffs Ss.	1,503
Lewis Shale	1,626
Cliffhouse Ss.	2,323
Menefee Fn.	3,037
Point Lookout Ss.	3,885
Mancos Shale	4,092
Mancos Silt	4,598
Gallup Fn.	4,858

The referenced surface elevation is 6895', KB 6911'

2. ESTIMATED DEPTH OF POTENTIAL WATER, OIL, GAS, & OTHER MINERAL BEARING FORMATIONS

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,381
Water/Gas	Pictured Cliffs Ss.	1,503
Water/Gas	Cliffhouse Ss.	2,323
Water/Gas	Menefee Fn.	3,037
Water/Gas	Point Lookout Ss.	3,885
Oil/Gas	Mancos Shale	4,092
Oil/Gas	Mancos Silt	4,598
Oil/Gas	Gallup Fn.	4,858

All shows of fresh water and minerals will be reported and protected.

3. PRESSURE CONTROL

- a) Pressure control equipment and configuration will be designed to meet 2M standards.
- b) Working pressure on rams and BOPE will be 3,000 psi.
- c) Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- d) The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- e) Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.
- f) Pressure tests are required before drilling out from under all casing strings set and cemented in place.

North Alamito Unit 306H (FKA Lybrook L34-2307 01H)
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 Sandoval County, New Mexico

- g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.
- k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).
- l) The choke and manifold shall contain two adjustable chokes.
- m) Hand wheels shall be installed on all ram preventers.
- n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all
- o) Inside BOP or float sub shall also be available on the rig floor at all times.

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

- a) The proposed casing design is as follows:

Casing	Depth (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42	
Surface	0'-500'	12 1/4"	9 5/8"	32.3	J55, STC New
Intermediate	0'-5500'	8 3/4"	7"	26	J55, LTC New
Production Liner	5300'-11567'	6 1/8"	4 1/2"	11.6	B80*, BTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (ppf)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lbs)	Collapse	Burst	Tension
9 5/8"	32.3	J55	STC	1370	2270	365	1.0	1.1	1.5
7"	26	J55	LTC	4330	4980	367	1.0	1.1	1.5
4.5"	11.6	B80	BTC	6350	7780	267	1.0	1.1	1.5

*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

North Alamito Unit 306H (FKA Lybrook L34-2307 01H)
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 Sandoval County, New Mexico

b) The proposed cementing program is as follows

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	248 sks	Class G w/ 2% CaCl Weight: 14.6ppg Yield: 13.8 ft ³ /sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5500'	100% open hole excess Stage 1 Lead: 618 sks Stage 1 Tail: 292 sks	Lead: Extended Class G w/ 6% BWOC bentonite + 5 lb/sk Kol-Seal + 0.125 lb/sk Poly-flake + 0.3% BWOC HR-5 Weight: 12.1ppg Yield: 2.038 ft ³ /sk Tail: Extended Class G w/ 1% BWOC bentonite + 0.3% BWOC Halad-567 + 0.2% BWOC Versaset + 0.05% SA-1015 Weight: 14.6ppg Yield: 1.059 ft ³ /sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5300'-11567'	30% open hole excess Cement Vol: 593 sks	Extended Class G w/ 2.5 lb/sk Kol-seal + 0.7% BWOC Halad-567 + 0.20% BWOC Halad-9 + 0.05% SA-1015 Weight: 13.5ppg Yield: 1.302 ft ³ /sk	Top of Liner	N/A

North Alamito Unit 306H (FKA Lybrook L34-2307 01H)
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Sandoval County, New Mexico

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 4368'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5116'/11567'	Gallup

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
26"	0-60'/60'	Fresh Water	8.3-9.2	38-100	NC
12 1/4"	0'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-5091'/5500'	Fresh Water LSND	8.3-10	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5091'/5500'- 5116'/11567'	Fresh Water LSND	8.3-10	15-25	<15

- c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.
- d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING, & LOGGING

- a) Drill Stem Testing - None anticipated.
- b) Coring - None anticipated.
- c) Mud Logging - Mancos Top to TD
- d) Logging - See below

North Alamito Unit 306H (FKA Lybrook L34-2307 01H)
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Sandoval County, New Mexico

Cased Hole:

CBL/CCL/GR/VDL will be run as needed for perforating control

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2399 psi based on a 9.0 ppg at 5127' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on March 1st, 2017. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 10 days.



CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)		4.500
Pipe Wall Thickness (ins)		0.250
Nominal Weight Per Foot (lbs)		
Thread Name		Buttress Casing
Grade Name	Pipe	SB 80
	Coupling	N80
Pipe Minimum Yield (psi)		80,000
Pipe Minimum Ultimate (psi)		90,000
Coupling Minimum Yield (psi)		80,000
Coupling Minimum Ultimate (psi)		100,000
Coupling or Joint Outside Diameter (ins)		5.000
Drift Diameter (ins)		3.875
Plain End Weight per Foot (lbs)		11.36
Joint Strength (lbs)		267,000
Internal Yield (psi)		7,780
Collapse Rating (psi)		6,350

API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Pipe Body Plain End Yield (lbs)		267,000
Leak @ E7 plane (psi)		17,380
Pipe Hydrostatic Test Pressure @ 80 % SMYS		7,100

* ALL MATERIAL CONTAINED IN THIS PUBLICATION IS FOR GENERAL INFORMATION ONLY. THIS MATERIAL SHOULD NOT THEREFORE, BE USED OR RELIED UPON FOR ANY SPECIFIC APPLICATION WITHOUT INDEPENDENT COMPETENT PROFESSIONAL EXAMINATION AND VERIFICATION OF ITS ACCURACY, SUITABILITY AND APPLICABILITY. ANY ONE MAKING USE OF THIS MATERIAL DOES SO AT THEIR OWN RISK AND ASSUMES ANY AND ALL LIABILITY RESULTING FROM SUCH USE. BOOMERANG TUBE, LLC DISCLAIMS ANY AND ALL EXPRESSED OR IMPLIED WARRANTIES OF FITNESS FOR ANY GENERAL OR PARTICULAR APPLICATION.

LOC: 1403' FSL, 762' FWL, Sec 34, T23N, R7W					Encana Natural Gas			ENG: L. Hubbard RIG: Unassigned GLE: 6895 RKBE: 6911		11-15-16	
County: Sandoval					WELL SUMMARY						
WELL: North Alamito Unit 306H (fka Lybrook L34-2307 01H)											
MWD	OPEN HOLE	FORM	DEPTH					HOLE SIZE	CASING	MW	DEVIATION
LWD	LOGGING		TVD	MD					SPECS	MUD TYPE	INFORMATION
			60	60'				26	16" 42# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2	
Multi-Well pad take survey every stand and run anti-collision report prior to spud	None	Nacimiento 9 5/8" Csg	0 500	500.00				12 1/4	9 5/8" 32.3ppf J55 STC TOC to Surface 100% OHE	Fresh wtr 8.3-10	Vertical <1°
Survey Every 60'-120', updating anticollision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs	Ojo Alamo Kirtland Shale Fruiland Coal Pictured Cliffs Ss. Lewis Shale Cliffhouse Ss. Menefee Fn. Point Lookout Ss. Mancos Shale	976 1,161 1,381 1,503 1,626 2,323 3,037 3,885 4,092					8 3/4	7" 26ppf J55 LTC TOC @ surface (100% OH excess) Stage 1 Total: 910sks	Fresh Wtr 8.3-10	Vertical <1°
Surveys every 30' through the curve	MWD GR Mud Log	KOP Mancos Silt Gallup Fn. 7" Csg	4,368 4,598 4,858 5,091	4,531							
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD Base Gallup	5,127 5,116 5,209	11,567				6 1/8	200' overlap at liner top 6067' Drilled Lateral TOC @ Top of Liner (30% open hole excess)		Horz Inc/TVD 90.1deg/5127'
MWD Gamma Directional										WBM 8.3-10	TD = 11567.1' MD